NORTHERN STATES POWER COMPANY and GREAT RIVER ENERGY

Application to the Minnesota Public Utilities Commission for a Route Permit

UPGRADE OF THE SOUTHWEST TWIN CITIES (SWTC) CHASKA AREA 69 KV TRANSMISSION LINE TO 115 KV CAPACITY

Alternative Permitting Process MPUC Docket No. <u>E002/TL-12-401</u>

JULY 11, 2012

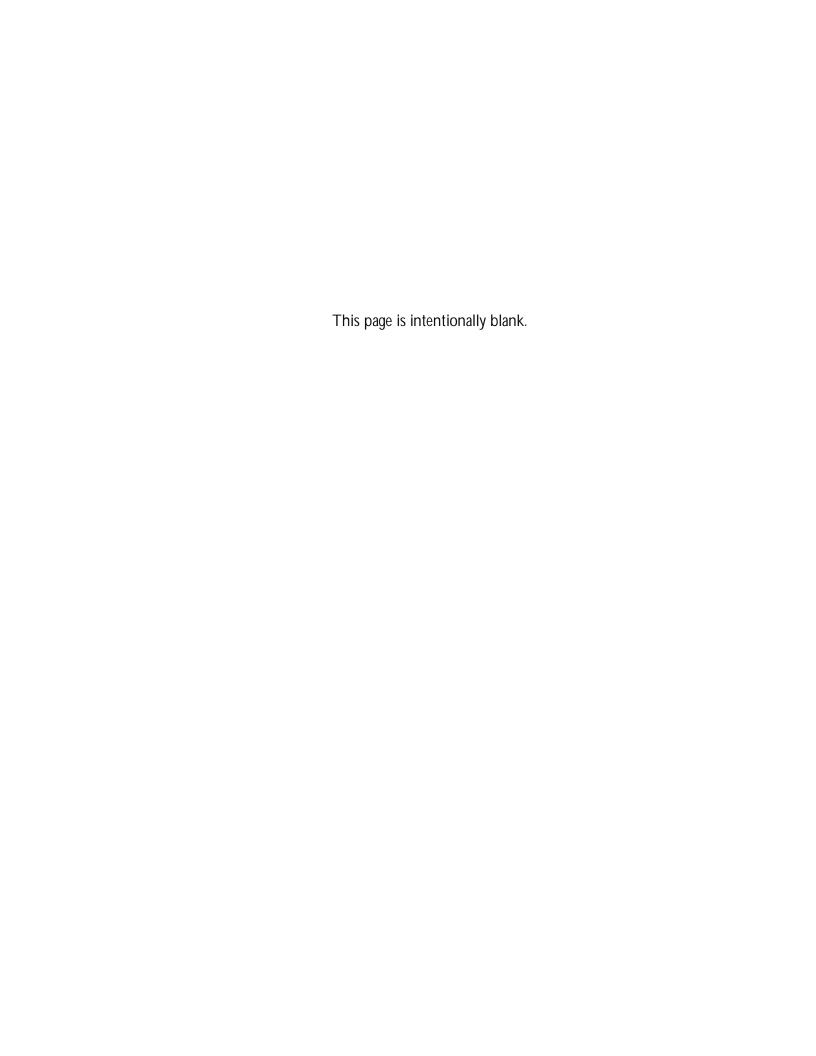


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1.0 EXECUTIVE SUMMARY

1.1 Proposal Summary

Northern States Power Company, a Minnesota Corporation, ("Xcel Energy") and Great River Energy ("GRE") (collectively, "Applicants") jointly submit this application ("Application") for a Route Permit to the Minnesota Public Utilities Commission ("MPUC" or "Commission") pursuant to Minnesota Statutes Section 216E and Minnesota Rules Chapter 7850.

A Route Permit is requested to:

- Upgrade approximately 6.1 miles of existing single circuit 69 kilovolt ("kV") transmission line (Line #0740) to a single circuit 115 kV transmission line (Segments 1, 4, & 6);
- Change the operating voltage of approximately 2.9 miles of existing Great River Energy 69 kV transmission line to operate at 115 kV (Segment 2);
- Construct two segments of new 115 kV single circuit transmission line totaling approximately 2.4 miles (Segments 3 & 5);
- Abandon in place approximately 1.0 mile of existing 69 kV transmission line (Segment 3a); and
- Remove approximately 0.39 miles of existing 69 kV transmission line through the central portion of the City of Chaska (Segment 5a).

The proposed Project is located in eastern Carver County and northern Scott County near and within the City of Chaska, and through Laketown, Dahlgren, and Jackson townships. Figure 1 shows a general overview of the proposed Project. The tan lines show where we are proposing to change the existing 69 kV line into a 115 kV line. By "change" we mean that, in most cases, we will remove the poles and wires that are there and replace them with new and larger poles and wires. The red lines show where we will be constructing new 115 kV transmission facilities. In these locations, this will mean we need to obtain new right-of-way to construct new poles and wires. The yellow line shows the existing Great River Energy 69 kV transmission line. This line was constructed using structures and conductors capable of accommodating a 115 kV line, but is not currently capable of operating at 115 kV due to

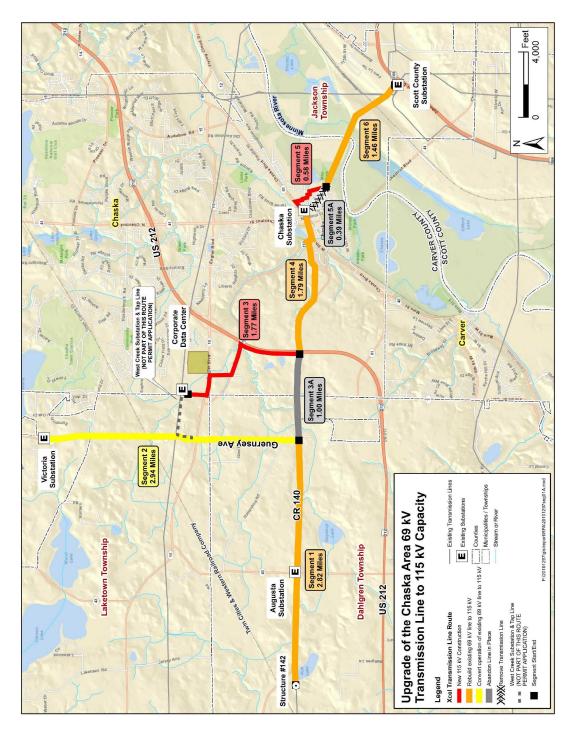
the 69 kV switch structure located at the intersection of County Road 140 and Guernsey Avenue. This 2.9 mile line will be converted to operate at 115 kV by retiring the existing 69 kV switch and re-terminating the line at that intersection. The black lines show where the existing 69 kV line will no longer be in operation. For the few blocks shown in the City of Chaska, the poles and wires will be removed since we are essentially moving the line to a new location (as shown by the red line through the City of Chaska). For the section along County Road 140 between Highway 212 and Guernsey Avenue, the existing line and structures will be left in place, but will not normally carry electricity. This is being done to keep the line available for use if a need arises in the future. Finally, the dotted grey line shows a new 115 kV line for which Xcel Energy has recently obtained a local permit from the City of Chaska to construct. This 115 kV line is not part of the Project proposed in this Application, but will connect Great River Energy's line to the City of Chaska's new West Creek Substation.

Minnesota Statutes Section § 216E.04 and Minnesota Rules 7850.2800 to 7850.3900 provide for an Alternative Permitting Process for certain high voltage transmission line ("HVTL") facilities. The proposed upgrade of a 69 kV transmission line to a 115 kV transmission line along with proposed new segments of 115 kV transmission line with associated facilities, qualify for consideration under the Alternative Permitting Process because the proposed new and upgraded transmission lines are between 100 and 200 kV (Minn. Stat. § 216E.04, subd. 2(3); Minn. R. 7850.2800, Subp. 1(C) authorizing alternative process for HVTLs between 100 and 200 kV). This Application is submitted pursuant to the Alternative Permitting Process outlined in Minnesota Rules 7850.2800 to 7850.3900. A Certificate of Need for this Project was submitted on May 15, 2012 in Docket No. E-002/CN-11-826.

The Applicants request that the Commission approve the proposed route and authorize a route width of 100 feet on each side of the route centerline of the existing 69 kV facilities (200 feet total width), and a route width of 200 feet on each side of the route centerline (400 feet total width) for areas of new transmission line construction.

Xcel Energy proposes to construct the proposed upgrade of the existing 69 kV line on the current centerline and within existing right-of-way (the majority of which is 50-feet wide) where reasonably possible. Xcel Energy typically requires a right-of-way width of 75 feet (37'6" from the centerline of the structure) for new 115 kV transmission line construction. No additional right-of-way will be required to convert the operation of approximately 2.9 miles of Great River Energy's existing Minnesota Valley-Victoria Substation Tap (MV-VTT) transmission line from 69 kV to 115 kV, as no physical modifications of the existing line will be required.

FIGURE 1
GENERAL OVERVIEW OF PROPOSED PROJECT



1.2 COMPLETENESS CHECKLIST

The content requirements for an application with the Commission under the Alternative Permitting Process are identified in Minnesota Rules 7850.2800 to 7850.3900. The rule requirements are listed in Table 1 with references indicating where the information can be found in this Application.

TABLE 1
COMPLETENESS CHECKLIST

Authority	Required Information	Where
Minn. R. 7850.2800,	Subpart 1. Eligible Projects	
Subp. 1(C)		
	An applicant for a site permit or a route permit for one of the	2.4
	following projects may elect to follow the procedures of parts	
	7850.2800 to 7850.3900 instead of the full permitting procedures in	
	part 7850.1700 to 7850.2700 for high voltage transmission lines of	
	between 100 and 200 kilovolts.	
Minn. R. 7850.2800	Subpart 2. Notice to MPUC	
Subp. 2		
	An applicant for a permit for one of the qualifying projects in subpart	2.5 and Appendix A.1
	1, who intends to follow the procedures of parts 7850.2800 to	
	7850.3700, shall notify the MPUC of such intent, in writing, at least 10	
	days before submitting an application for the projects.	
Minn. R. 7850.3100	Contents of Application (alternative permitting process)	
	The applicant shall include in the application the same information	4.3 (See also
	required in part 7850.1900, except the applicant need not propose any	7850.1900, Subp. 2
	alternative sites or routes to the preferred site or route. If the applicant	below)
	has rejected alternative sites or routes, the applicant shall include in the	
	application the identity of the rejected sites or routes and an	
	explanation of the reasons for rejecting them.	
Minn. R. 7850.1900, Subp. 2	Route Permit for HVTL	
(applicable per Minn. R.		
7850.3100)		
A.	a statement of proposed ownership of the facility at the time of filing	2.1
	the application and after commercial operation	
B.	the precise name of any person or organization to be initially named as	2.2
	permittee or permittees and the name of any other person to whom	
	the permit may be transferred if transfer of the permit is contemplated	

Authority	Required Information	Where
C.	at least two proposed routes for the proposed high voltage	Not applicable, per
	transmission line and identification of the applicant's preferred route	Minn. R. 7850.3100
	and the reasons for the preference	
D.	a description of the proposed high voltage transmission line and all	3.2, 4.1, 5.1.1
	associated facilities including the size and type of the high voltage	
	transmission line	Car Mian D
E.	the environmental information required under 7850.1900, Subp. 3	See Minn. R. 7850.1900, Subp. 3
		(A)–(H) below
F.	identification of land uses and environmental conditions along the	Chapter 6.0
	proposed routes	Onapter 0.0
G.	the names of each owner whose property is within any of the proposed	7.2, Appendix E.1
	routes for the high voltage transmission line	. 11
H.	United States Geological Survey topographical maps or other maps	Appendix B
	acceptable to the chair showing the entire length of the high voltage	
	transmission line on all proposed routes	
I.	identification of existing utility and public rights-of-way along or	5.1.2
	parallel to the proposed routes that have the potential to share right-of-	
	way, the land used by a public utility (as for a transmission line), with	
	the proposed line	Objection F O
J.	the engineering and operational design concepts for the proposed high	Chapter 5.0
	voltage transmission line, including information on the electric and magnetic fields of the transmission line	
K.	cost analysis of each route, including the costs of constructing,	3.5 and 5.1.6
IX.	operating, and maintaining the high voltage transmission line that are	3.3 drid 3.1.0
	dependent on design and route	
L.	a description of possible design options to accommodate expansion of	4.5
	the high voltage transmission line in the future	
M.	the procedures and practices proposed for the acquisition and	5.1.3 – 5.1.7
	restoration of the right-of-way, construction, and maintenance of the	
	high voltage transmission line	
N.	a listing and brief description of federal, state, and local permits that	7.4
	may be required for the proposed high voltage transmission line	
О.	a copy of the Certificate of Need or the certified HVTL list containing	2.3
	the proposed high voltage transmission line or documentation that an application for a Certificate of Need has been submitted or is not	
	required	
Minn. R. 7850.1900, Subp. 3	Environmental Information	
A.	a description of the environmental setting for each site or route	6.1
B.	a description of the effects of construction and operation of the facility	6.2
D.	on human settlement, including, but not limited to, public health and	0.2
	safety, displacement, noise, aesthetics, socioeconomic impacts, cultural	
	1 J Place History access access access access access access and access acc	

Authority	Required Information	Where
	values, recreation, and public services	
C.	a description of the effects of the facility on land-based economies,	6.3
	including, but not limited to, agriculture, forestry, tourism, and mining	
D.	a description of the effects of the facility on archaeological and historic	6.4
	resources	
E.	a description of the effects of the facility on the natural environment,	6.5
	including effects on air and water quality resources and flora and fauna	
F.	a description of the effects of the facility on rare and unique natural	6.6
	resources	
G.	identification of human and natural environmental effects that cannot	See all of the effects
	be avoided if the facility is approved at a specific site or route	described in Chapter
		6.0
H.	a description of measures that might be implemented to mitigate the	See all of the
	potential human and environmental impacts identified in items A to G	mitigative measures
	and the estimated costs of such mitigative measures	identified in Chapter
		6.0

2.0 INTRODUCTION

2.1 STATEMENT OF OWNERSHIP

Xcel Energy is a Minnesota corporation and a wholly-owned subsidiary of Xcel Energy Inc., a utility holding company with its headquarters in Minneapolis. Xcel Energy provides electricity services to approximately 1.3 million customers and natural gas services to 425,000 residential, commercial and industrial customers in Minnesota. Xcel Energy Services Inc. is the service company for Xcel Energy and its personnel prepare, submit and administer regulatory applications to the Commission on behalf of Xcel Energy, including route permit applications.

Great River Energy is a not-for-profit generation and transmission cooperative with its headquarters in Maple Grove, Minnesota. Great River Energy provides electrical energy and related services to 28 member distribution cooperatives, including Minnesota Valley Electric Cooperative, which serves a portion of the Proposed Route.

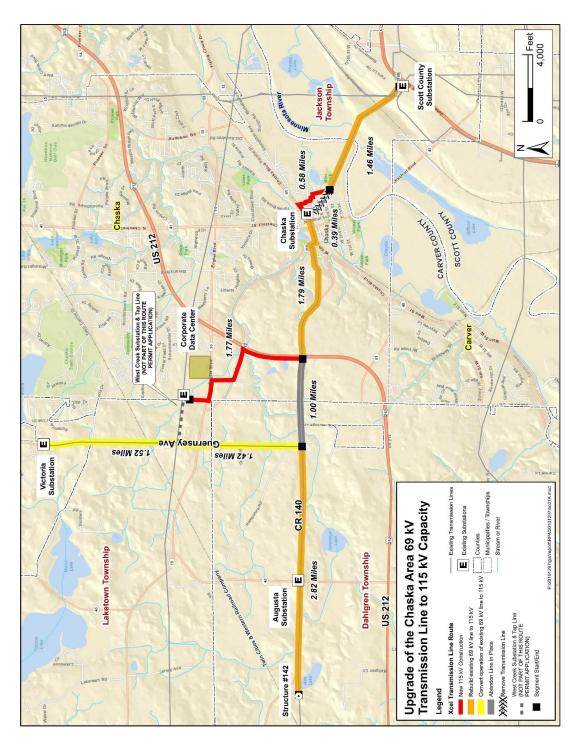
Xcel Energy will construct, own, and operate:

- The upgraded and new 115 kV single circuit transmission lines and associated facilities between existing Structure #142 on Xcel Energy Line #0740 west of Aue Lake in Carver County and the existing Scott County Substation (Segments 1, 4, 5, and 6);
- The new 115 kV single circuit transmission line from the intersection of Highway 212 and County Road 140 to the West Creek Substation (owned and operated by the City of Chaska) (Segment 3);
- The existing 69 kV single circuit transmission line along County Road 140 between Guernsey Avenue and Highway 212 that will be abandoned in place (Segment 3a).

Great River Energy will continue to own and operate:

- The existing 2.9-mile 69 kV MV-VTT line proposed to be converted to 115 kV located between the intersection of County Road 140 with Guernsey Avenue and the Victoria Substation (Segment 2).
- Ownership of substations will not change from the current ownership.

FIGURE 2 PROPOSED ROUTE



2.2 PERMITTEES

The permittees for the proposed Project are:

(1) Northern States Power Company, a Minnesota corporation

Contact: Sage Tauber

Permitting Analyst

Address: Xcel Energy Services Inc.

414 Nicollet Mall, MP-8A Minneapolis, MN 55401

Phone: (612) 330-2909

E-mail: <u>Sage.Tauber@xcelenergy.com</u>

(2) Great River Energy

Contact: Carole Schmidt

Supervisor, Transmission Permitting & Compliance

Address: Great River Energy

12300 Elm Creek Boulevard Maple Grove, MN 55369

Phone: (763) 445-5214

E-mail: cschmidt@grenergy.com

2.3 CERTIFICATE OF NEED

Minnesota Statutes Section 216B.243, subd. 2 states that no large energy facility shall be sited or constructed in Minnesota without the issuance of a Certificate of Need ("CON") by the Commission. The proposed 115 kV single circuit transmission line is a "large energy facility" because it has a capacity in excess of 100 kV and is more than 10 miles long. The Applicants filed a CON with the Commission on May 15, 2012 (Docket No. E-002/CN-11-826). The Applicants are requesting the CON and Route Permit application be considered together and that a joint hearing be held pursuant to Minn. Stat. Section 216B.243, subd. 4; Minn. R. 7850.2600, Subp. 3 and Minn. R. 7849.1900, subp. 4.

2.4 ROUTE PERMIT, ALTERNATIVE PERMITTING PROCESS

The Project qualifies for review under the Alternative Permitting Process authorized by Minnesota Statutes Section 216E.04, subd. 2(3) and Minnesota Rules 7850.2800, Subp. 1(C) because the Project is a high voltage transmission line between 100 and 200 kV. Accordingly, the Applicants are following the provisions of the Alternative Permitting Process outlined in Minnesota Rules 7850.2800 to 7850.3900 for this Project.

2.5 NOTICE TO THE COMMISSION

Xcel Energy notified the Commission on April 23, 2012 by letter (mailed and electronically filed) that the Applicants intend to use the Alternative Permitting Process for the Project. This letter complies with the requirement of Minnesota Rules 7850.2800, Subp. 2, to notify the Commission of this election at least 10 days prior to submitting an application for a Route Permit. A copy of the letter is included in Appendix A.1.

3.0 PROJECT INFORMATION

3.1 Project Location

The Project is located in Carver and Scott Counties, and within the City of Chaska, Dahlgren Township, Laketown Township, and Jackson Township. The western end of the Proposed Route is located in Dahlgren Township, Carver County, west of Aue Lake at existing structure #142. The Project extends north along the existing Great River Energy MV-VTT line through Laketown Township, and east through the City of Chaska. The Proposed Route continues across the Minnesota River into Jackson Township in Scott County to the eastern terminus of the Project at the Scott County Substation.

Appendix B includes detailed maps of the Proposed Route (Segments 1-6). Table 2 below identifies the counties, cities and townships ("Local Government Units" or "LGUs") in addition to the Public Land Survey ("PLS") designation of areas occupied by the proposed route.

TABLE 2 PROJECT LOCATION

County/Township or City	PLS Township (N)	PLS Range (W)	PLS Sections
Carver / Dahlgren TWP	115	24	1-4, 9-12
Carver / Laketown TWP	116	24	25 and 36
Carver / City of Chaska	116	23	31
Carver/City of Chaska	115	23	4, 6-9
Scott/Jackson TWP	115	23	10, 15

3.2 Project Proposal

The Proposed Route covers a total of approximately 12.75 miles and primarily follows existing transmission line rights-of-way. The Applicants propose to:

- Upgrade approximately 6.1 miles of existing single circuit 69 kilovolt (kV) transmission line (Line #0740) to a single circuit 115 kV transmission line (Segments 1, 4, & 6);
- Change the operating voltage of approximately 2.9 miles of existing Great River Energy 69 kV transmission line to operate at 115 kV (Segment 2);
- Construct two segments of new 115 kV single circuit transmission line totaling approximately 2.4 miles (Segments 3 & 5);
- Abandon in place approximately 1.0 mile of existing 69 kV transmission line (Segment 3a); and
- Remove approximately 0.39 miles of existing 69 kV transmission line through the middle of the City of Chaska (Segment 5a).

Figure 2 shows the Proposed Route and detailed maps are included in Appendix B. The tan lines show where we are proposing to change the existing 69 kV line into a 115 kV line. By "change" we mean that, in most cases, we will remove the poles and wires that are there and replace them with new and larger poles and wires. The red lines show where we will be constructing new 115 kV transmission facilities. In these locations, this will mean we need to obtain new right-of-way to construct new poles and wires. The yellow line shows the existing Great River Energy 69 kV transmission line. This line was constructed using structures capable of accommodating a 115 kV line, but is not currently capable of operating at 115 kV due to the 69 kV switch structure located at the intersection of County Road 140 and Guernsey Avenue. This 2.9 mile line will be converted to operate at 115 kV by retiring the existing 69 kV switch and re-terminating the line at that intersection. The black lines show where the existing 69 kV line will no longer be in operation. For the few blocks shown in the City of Chaska, the poles and wires will be removed since we are essentially moving the line to a new location (as shown by the red line through the City of Chaska).

For Segment 3a along County Road 140 between Highway 212 and Guernsey Avenue, the existing line will be left in place, but will not normally carry electricity. This is being done to keep the line available for use if a need arises in the future. Finally, the dotted grey line shows a new 115 kV line for which Xcel Energy has recently obtained a local permit from the City of Chaska to construct. This 115 kV line is not part of the Project proposed in this Application, but will connect Great River Energy's line to the City of Chaska's new West Creek Substation.

The proposed Project is located in eastern Carver County and northern Scott County near and within the City of Chaska, and through Laketown, Dahlgren, and Jackson townships.

3.3 **Need for Project**

Xcel Energy and Great River Energy initiated the Certificate of Need (CON) application process with the Commission on August 11, 2011 by filing a Notice Plan Petition in Docket No. E002/CN-11-826. The Applicants submitted a CON application on May 15, 2012. A summary of the need for the Project is presented below.

The proposed Project is needed so that the transmission system can reliably meet the growing demand for electric power in and near the City of Chaska. The need for the proposed Project was identified in the *Southwest Twin Cities Load Serving Study Review (Highway 212 Corridor 115 kV Conversion)* dated August 8, 2011 (also referred to as the "Study") prepared by Xcel Energy. The Study was conducted to address the growing demand for electric power in the southwest Twin Cities area due, in part, to the proposed construction of a new 190,000 square-foot data center¹ in Chaska, Minnesota that will add 20 megawatts of additional load to the area when it is fully operational.

Xcel Energy is currently in the process of removing an existing 69 kV transmission line between the cities of Glencoe and Waconia and replacing it with a new 115 kV transmission line. Xcel Energy received a Certificate of Need and a Route Permit for this Glencoe to Waconia rebuild in November 2011 (Docket Nos. E002/CN-09-1390 and E002/TL-10-249). As part of the Glencoe to Waconia rebuild project, the 69 kV line west of the Augusta Substation is being removed and replaced with a 115 kV line that will be operated at 69 kV capacity. Xcel Energy determined that this line west of the Augusta Substation was capable of meeting the anticipated demand for electric power in the Study area until 2018. Due to the addition of a data center in Chaska, which is expected to increase the demand for electric power by more than 30% when it is fully operational, additional 115 kV transmission facilities are needed by 2013 to meet this increased electric load demand in the area. Additionally, the City of Chaska has indicated that there is a possibility of an additional data center of the same or similar size may be developed in the same area in the future.

¹ UnitedHealth plans 2nd Twin Cities data center, Minneapolis | St. Paul Business Journal, http://www.bizjournals.com/twincities/stories/2010/03/22/story1.html?page=all (March 21, 2010).

The Study was prepared to identify the reliability problems that will arise on the current transmission system when the electrical demand increases by 30% over the current area load (20 megawatts) in the City of Chaska as a result of the new data center. The large electrical demand addition will result in the Scott County Substation transformers exceeding their emergency rating when certain transmission lines are out-of-service. Operating substation transformers above their emergency rating has the potential to shorten the lifespan of these transformers and increases the risk of a transformer failure. Absent construction of the Project, when the 69 kV line from the Scott County Substation to Chaska Substation is out of service, transmission line overloads in the area of the Project are anticipated and possible low voltage conditions may occur. Overloading of the transmission system can result in outages for residential, retail, commercial, and industrial customers. Outages can be extremely costly and inconvenient. Low voltage conditions, if experienced, can damage customer equipment such as process controls, motor drive controls, electronics, and automated machines.

The Project will provide the necessary transmission system upgrades to reduce the anticipated strain on the existing Scott County Substation transformers that serve the cities of Chaska, Augusta, and Victoria. Additionally, the Study indicated that the Project will eliminate some of the transmission line overloads experienced when the Scott County to Chaska 69 kV line is out of service and possible low voltage conditions on the existing 69 kV system west of the Augusta Substation.

Additional information regarding the need for the Project can be found in the Applicants' CON application.

3.4 Project Schedule

Construction of the Project is expected to begin soon after permits are obtained with an inservice date of spring 2014. This schedule is based on information available at the date of this filing and planning assumptions that balance the timing of implementation with the availability of crews, materials and other practical considerations. This schedule may be revised as further information is developed.

3.5 Project Costs

Depending on the route of the line and potential need for additional new right-of-way, Applicants estimate the overall cost of the proposed improvements fall within a range of \$13 and \$27 million. Cost estimates for Project segments are provided in Table 3 below. This

range of costs accounts for considerations related to labor, materials, and varying construction conditions.

TABLE 3
PROJECT COSTS

Project Portion	Cost in Million \$
Substation Upgrades	\$10.9
Transmission Line Upgrades	\$7.3
Total Cost Estimate	\$18.2

Operating and maintenance costs for the Project will be nominal for several years, since the line will be new and vegetation trimming of the corridor will occur prior to construction. Typical annual operating and maintenance costs for 115 kV transmission lines across Xcel Energy's Upper Midwest system area are on the order of \$300 to \$500 per mile of transmission right-of-way. The principal operating and maintenance cost will include inspections, which are usually done by fixed-wing aircraft and by helicopter on a regular basis (typically quarterly and annually respectively).

The Applicants perform periodic inspections of substations and equipment. The type and frequency of inspection varies depending on the type of equipment. Typical inspection intervals are semi-annual or annual. Maintenance and repair are performed on an as-needed basis, and therefore the cost varies from substation to substation.

4.0 FACILITY DESCRIPTION AND ROUTE SELECTION RATIONALE

4.1 Transmission Line Description

The Proposed Route includes upgrading an existing single circuit 69 kV line to a single circuit 115 kV transmission line (Line #0740) between existing structure #142 located approximately 200 feet west of Aue Lake and the Scott County Substation located approximately 0.3 miles southeast of Fern Lane Terrace along the west edge US Highway 169. The Proposed Route covers a total of approximately 12.75 miles and primarily follows existing transmission line corridors.

A detailed description of the Proposed Route is provided in Table 4. Figure 3 provides an overview of the Proposed Route and Appendix B.1 provides more detail on the Proposed Route.

The Proposed Route segments are described in detail as follows:

- <u>Segment 1:</u> Upgrade approximately 2.82 miles of existing 69 kV transmission line (Line #0740) to a 115 kV single circuit transmission line between existing structure #142 west of Aue Lake to an interconnection with an existing 69 kV Great River Energy transmission line (MV-VTT) in the southwest quadrant of the intersection of County Road 140 and Guernsey Ave. This Proposed Route will proceed along the south side of County Road 140 within existing right-of-way.
- <u>Segment 2</u>: Convert approximately 2.94 miles of the operating voltage from 69 kV to 115 kV on the Great River Energy Victoria tap line (MV-VTT) from the intersection of County Road 140 and Guernsey Avenue to the Victoria Substation. This line was originally constructed using 115 kV structures, but is currently not capable of operating at 115 kV due to the 69 kV switch structure in place located at the intersection of County Road 140 and Guernsey Avenue. The proposed Project involves replacing the existing 69 kV switch with a 115 kV switch structure. No additional physical work or right-of-way is required on this segment of line to change the operating voltage of the line to 115 kV.

- <u>Segment 3:</u> Construct approximately 1.78 miles of new 115 kV single circuit transmission line along the west side of Highway 212 from the intersection with County Road 140 extending north approximately 0.71 miles to the south side of Creek Road, then northwesterly to the intersection with Wetzel Lane. At this point, the Proposed Route extends north approximately 0.61 miles to the south side of Engler Blvd. The Proposed Route then extends west for approximately 0.24 miles then turns north and extends approximately 0.22 miles to terminate at the City of Chaska's West Creek Substation.
- <u>Segment 3a:</u> Abandon in place approximately 1.0 mile of existing 69 kV transmission line along the south side of County Road 140 between the intersection of County Road 140 and Guernsey Ave and the intersection of County Road 140 and Highway 212.
- Segment 4: Upgrade approximately 1.79 miles of existing 69 kV transmission line to a 115 kV single circuit transmission line along the south side of County Road 140 from the intersection with Highway 212 to the intersection of E. 6th Street and N. Oak Street. This segment terminus is located at the site of the current Chaska Substation, which is scheduled to be retired prior to the completion of the proposed Project. This segment of the Proposed Route extends from the Highway 212/County Road 140 intersection to the east/southeast for approximately 0.7 miles and then continues east approximately 0.7 miles to a structure east of the intersection of Creek Lane and Creek Road. The Proposed Route then follows Creek Road south to Chaska Blvd. for a short distance (West 6th Street) where it then follows the north side of Chaska Blvd. eastward approximately 0.3 miles to the intersection of Chaska Blvd. and Walnut Street. At that point the Proposed Route crosses to the south side of Chaska Blvd., and then extends east to the intersection of E. 6th Street and N. Oak Street.
- <u>Segment 5:</u> Construct approximately 0.58 miles of new 115 kV single circuit transmission line within the City of Chaska. From the Chaska Substation, the Proposed Route extends northeast, parallel to the south side of the railroad tracks along Chaska Blvd. The Proposed Route then extends south then east along the east side of Maple Street. From there the Proposed Route crosses east Chaska Creek and then extends south along the east side of Beech Street to 2nd Street where the Proposed Route intersects Segments 5a and 6.

- <u>Segment 5a</u>: Remove approximately 0.39 miles of existing 69 kV transmission line in the City of Chaska from the existing Chaska Substation to 2nd Street and Beech Street. The existing 69 kV line currently extends south along North Oak Street to East 5th Street where it then extends southeast to the intersection of East 2nd Street and Beech Street. Where Segment 5a has underbuilt distribution lines, the existing poles will be cut above the distribution lines and the top portion of the pole and transmission conductor will be removed. The existing easement in these areas will remain unchanged.
- <u>Segment 6:</u> Upgrade approximately 1.46 miles of existing 69 kV transmission line to a single circuit 115 kV transmission line. This segment of the Proposed Route begins at Structure #12 south of the intersection of East 2nd Street and Beech Street and extends southeast across the Minnesota River to terminate at the Scott County Substation located 1,600 feet southeast of Fern Lane Terrace along the west edge of US Highway 169.

FIGURE 3 PROPOSED ROUTE SEGMENTS

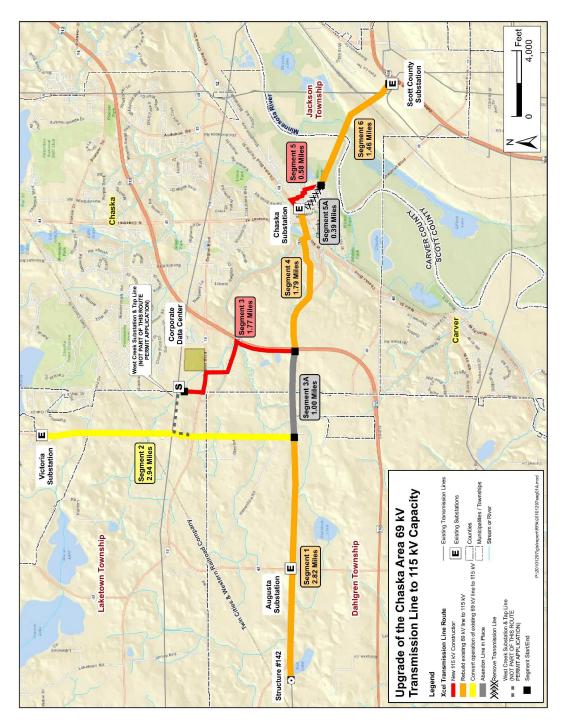


TABLE 4 DETAILED DESCCRIPTION OF PROPOSED ROUTE

Route Segment	Distance	Road and Public Waters Crossing				
SEGMENT 1: Upgr	ade 2.82 miles of 6	69 kV to a single circuit 115 kV transmission				
line from Structure #	142 east to existin	g the Great River Energy transmission line at				
the southwest quad	the southwest quadrant of the intersection of County Road 140 & Guernsey Ave.					
		Cross Public Water Wetland Aue Lake at				
East along		0.0 mile; Cross tributary to Chaska Creek				
south side of	2.82 miles	at 0.50 miles; Cross CSAH 43 at 1.25 miles;				
County Rd 140		End segment at intersection with				
		Guernsey Avenue.				
SEGMENT 2: Conve	rt 2.94 miles of ex	iting Great River Energy (MV-VTT) 69 kV to				
115 kV transmission	line - From the	southwest quadrant of the intersection of				
County Road 140 and	Guernsey Ave, No	orth to the Victoria Substation.				
		Cross County Road 140 at 0.0 mile; Cross				
		Hampshire Road at 0.16 mile; Cross				
		tributary to Chaska Creek at 0.37 mile;				
		Cross Glens Road at 0.73 mile; Cross				
North along	2.94 miles	Creek Road (CSAH 10) at 1.17 miles; Cross				
Guernsey Ave		to east side of Guernsey Ave at 1.34 miles;				
		Cross Chaska Creek at 1.74; Cross railroad				
		at 1.75 miles; Cross County Road 11				
		(Marsh Lake Rd.) at 2.43 miles; End at				
		Victoria Substation.				
SEGMENT 3: New cons	truction of 1.77 mi	les of 115 kV Transmission Line – From the				
southwest quadrant of the	County Road 140	and Hwy 212 intersection to the future West				
	Creek Su	ubstation.				
North along west side of		Cross County Rd 140 at 0.0 mile; Cross				
Hwy 212	0.71 miles	unnamed tributary to Chaska Creek at 0.63				
1 100 y 212		miles; Cross Creek Road at 0.71 miles.				
Northwesterly along	0.38 miles					
south side of Creek Road	0.30 HIIICS					
North between Creek						
Road and	0.23 miles					
Engler Blvd						

Route Segment	Distance	Road and Public Waters Crossing		
West along south side of Engler Blvd	0.23 miles			
North across undeveloped land	0.22 miles	Cross Engler Blvd. (CSAH 10) at 1.57 miles; Cross Chaska Creek at 1.78 miles; enter West Creek Substation.		
SEGMENT 3a: Retire 1.0 mile of existing 69 kV transmission line – From the intersection of County Road 140 and Guernsey Ave to the intersection of County Rd 140 and Hwy 212.				
East along south side of County Road 140	1.0 miles	Cross unnamed tributary to Chaska Creek at 0.18 mile; Cross Creekside Lane at mile 0.25; Cross CSAH 11 at 0.50 mile; End segment at CR 140 Hwy 212.		
SEGMENT 4: Upgrade 1.79 miles of 69 kV to a single circuit 115 kV transmission line –				
From the southwest quadrant of the intersection of County Road 140 and Hwy 212 to the existing Chaska Substation.				
East along south side of County Road 140	0.0 miles	Cross US Highway 212		
East/southeast along County Road 140	0.70 miles	Cross County Road 140 at 0.70 mile		
East to intersection of Creek Lane and Creek Road	0.70 miles	Cross Tupelo Way at 1.12 miles; Cross Cascade Drive at 1.22 miles; Cross Chaska Creek at 1.38 miles; Cross Creek Road at 1.39 miles.		
South (0.06 mile) to Chaska Blvd., then east along Chaska Blvd to Chaska Substation	0.39 miles	Cross Fireman's Clayhole Public Water (10-226P) at 1.39 miles; Cross Chestnut Street at 1.63 miles; Cross Walnut Street and Chaska Blvd at 1.71 miles; Cross railroad at 1.75; End segment at Chaska Substation.		
	SEGMENT 5: Construct a new 0.58 mile single circuit 115 kV transmission line from the			
Chaska Substation to the existing structure south of the intersection of East 2 nd Street and Beech Street in the City of Chaska.				
Northeast along Chaska Blvd.	0.14 miles	Cross unnamed tributary to Minnesota River (Chaska Creek East) at 0.04 mile.		
South and east along Maple Street	0.24 miles	Cross East 6 th Street at 0.23 miles; Cross Beech Street at 0.37 mile		

Route Segment	Distance	Road and Public Waters Crossing	
South along east side of Beech Street	0.20 miles	Cross unnamed tributary to Minnesota River (Chaska Creek East) at 0.38 mile; End segment at existing structure.	
SEGMENT 5a: Retire 0.39 miles of existing 69 kV Transmission Line in City of Chaska from Chaska Substation to intersection of East 2 nd Street and Beech Street.			
SOUTH EAST	0.39 miles	Cross East 6 th Street at 0.02 mile; Cross East 5 th Street at 0.09 mile; Cross East 4 th Street at 0.18 mile; Cross North Ash Street at 0.19 mile; Cross East 3 rd Street at 0.27 mile, Cross North Maple Street at 0.30 mile, Cross East 1 st Street at 0.35 mile, Cross East 2 nd Street at 0.37 mile.	
SEGMENT 6: Upgrade 1.46 miles of a 69 kV transmission line to a single circuit 115 kV			
transmission line – From southeast of the intersection of East 2 nd Street and Beech Street			
to the existing Scott County Substation.			
SOUTH EAST	1.46 miles	From the existing structure cross the Minnesota River at 0.60 mile; Cross Union Pacific Railroad tracks at 1.11 mile; end Segment 6 and project at Scott County Substation.	

4.2 ROUTE WIDTH AND ALIGNMENT SELECTION PROCESS

The Proposed Route for the Project was developed by the Applicants' permitting and engineering personnel based on their investigation of the overall Proposed Route and input from government entities and the public. The Applicants also performed an analysis of environmental resources along the Proposed Route by using computer mapping, aerial photographs, and topographic maps. Environmental resources identified along the Proposed Route are discussed in Sections 6.5 and 6.6 of this Application. A list of wildlife species that is representative of the Proposed Route is contained in Appendix C. The Proposed Route is designed to best minimize the overall impacts of the Project.

On March 7, 2011, Xcel Energy provided Project information and requested comments from Local Government Units ("LGUs") located within the vicinity of the Proposed Route. See Section 7.1 and Appendix D of this Application for additional information.

A public open house meeting was held at Chaska City Hall in Chaska, Minnesota on May 4, 2011 (Appendix E). A notice of the open house meeting was published on April 27, 2011 in the Shakopee Valley News, and on April 28, 2011 in the Chaska Herald. See Appendix E.2. Twenty-four people signed the attendance sheet for this open house meeting. See Appendix E.3. The attendees focused primarily on the location of the transmission line in residential areas in the City of Chaska and the style and placement of utility structures on or near private property.

The proposed transmission line routes were developed with the following primary objectives:

- Maximize use of existing transmission line alignments and rights-of-way;
- Minimize impacts to residences;
- Minimize use of new right-of-way; and
- Minimize impacts to environmental and sensitive resources.

The Applicants believe the Proposed Route for the Project best meet the objectives stated above. In particular, the Proposed Route maximizes the use of existing transmission and road rights-of-way for all but approximately 2.36 miles of its length. The use of existing transmission line corridors reduces the need for new transmission line corridors, and minimizes impacts to residences and environmental and sensitive resources.

The Power Plant Siting Act ("PPSA"), Minn. Stat. Chapter 216E, directs the Commission to locate transmission lines in a manner that "minimize[s] adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring their electric needs are met and fulfilled in an orderly and timely fashion." Minn. Stat. § 216E.02, subd. 1. The PPSA also authorizes the Commission to meet its routing responsibility by designating a "route" for a new transmission line when it issues a Route Permit. The route may have "a variable width of up to 1.25 miles" within which the right-of-way for the facilities can be located. Minn. Stat. § 216E.01, subd. 8.

The purpose of the route permitting process is not to establish an exact centerline for a transmission line, but rather to establish a general alignment that best balances competing land uses and minimizes human and environmental impacts. Once a route is established by the Commission, the utility then does more detailed engineering and contacts landowners to gather additional detailed information about the circumstances of their property. Only after considering all input does the utility establish an exact centerline of the transmission line and pole placement. A route designation by the Commission should be wide enough to provide

flexibility for the utility to work with landowners to adjust final design. Once the utility establishes a centerline and structure placement, construction drawings are provided to the Commission so the Commission can confirm that the utility's plans are consistent with the route permit. At the same time, a route designation cannot be so wide that it is unclear what the intended general alignment of the transmission line is meant to be.

"Route Width" vs. "Right-of-Way"

For this Project, the Applicants request a route width of 100 feet on each side of the centerline along the existing transmission line route segments (i.e., 200 feet total width for Segments 1, 4, & 6), and a route width of 200 feet on each side of the centerline along the new transmission line route segments (i.e., 400 feet total width for Segments 3 & 5). An illustrative schematic of this issue is provided in Figure 4.

The route width is the area in which the utility is allowed to complete the final design. The right-of-way (ROW), on the other hand, is the specific area that is actually required for the final easement for the transmission line. In this case, the requested route width is 200 feet for rebuild segments and 400 feet for new construction segments. However, the ROW actually needed for the transmission line facilities is only 75 feet wide, and may be even less in areas where the transmission line can share ROW with other infrastructure such as roads or highways, or in areas where the ROW for the existing transmission line is being utilized. Requesting a route width wider than the actual ROW needed gives the utility flexibility to make alignment adjustments to work with landowners, avoid sensitive natural resource or cultural resource areas, and to manage construction constraints (i.e., steep slopes, poor soils, etc.).

Although Xcel Energy has presented an anticipated alignment in this application (i.e., where the transmission line is expected to be located given the overall Project analysis performed to date), as further information is gathered and comments are received throughout the permit review process, the anticipated alignment may change slightly in any given area within the approved route width. For example, transmission structures may be relocated from the anticipated alignment to elsewhere within the approved route width to minimize necessary tree removal, avoid wetlands or other sensitive habitats, and/or increase the distance of the transmission line from residences. Detailed maps showing the anticipated alignment and the requested route width are included in Appendix B.

FIGURE 4 ROUTE WIDTH VS RIGHT-OF-WAY



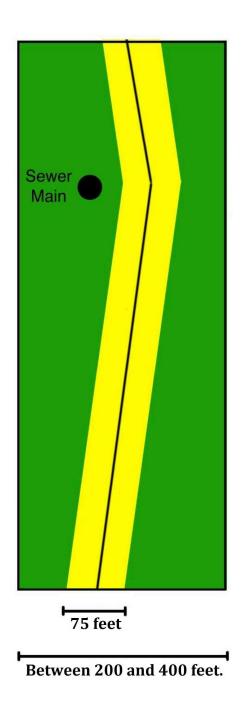
The route width is the area in which the utility is allowed to complete the final design

Right-of-Way (ROW)

The right-of-way is the specific area that is actually required for the final easement for the transmission line.

Anticipated Alignment

Expected location of the transmission line based on project analysis.



4.3 ALTERNATIVE ROUTE SEGMENTS CONSIDERED

In evaluating the route for the proposed Project, Xcel Energy focused predominantly on the right-of-way of existing transmission lines because it minimizes new environmental impacts and maximizes the use of existing utility corridors. Xcel Energy also considered two route alternatives, including (1) Creek Road Alternative along Segment 3, and (2) Segment 5a Rebuild Alternative along Segment 5a. These two alternatives are discussed in detail below.

Creek Road Route Alternative along Segment 3

Xcel Energy evaluated a route alternative included in Segment 3 that follows along the north side of Creek Road, past the intersection with Wetzel Lane, extending approximately 0.27 miles to the northwest to the property line and then extending to the north approximately 0.13 miles to the south side of Engler Boulevard where it intersects with the proposed route (Figure 5).

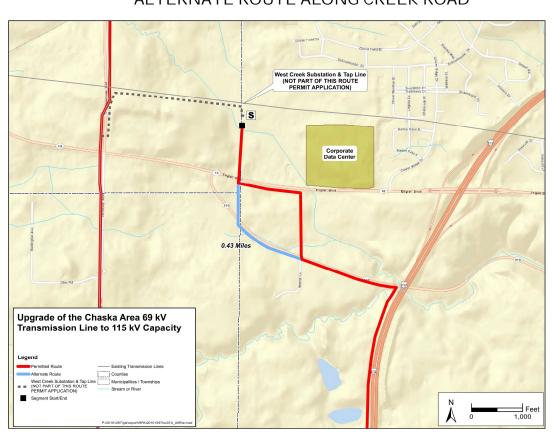


FIGURE 5
ALTERNATE ROUTE ALONG CREEK ROAD

This alternate route was investigated in response to public comments received during the public meetings and prior to filing this Application regarding the proposed Project. This alternate route was not selected because it would require the acquisition of additional private easements, increase the number of public road crossings, and increase the number of wetland crossings.

<u>Segment 5a Rebuild Alternative: Rebuild 115 kV line in existing 69 kV alignment along Segment 5a</u>

The Segment 5a Rebuild Alternative would involve the construction the 115 kV line within the easement of the existing 69 kV alignment through the central portion of the City of Chaska along Segment 5a. The alternate route would extend from the location of the current Chaska Substation at the intersection of East 6th Street and North Oak Street to the intersection of 2nd Street and Beech Street.

Xcel Energy met with representatives from the City of Chaska and Carver County early in the Project planning stage to discuss routing options for the 115 kV transmission line upgrade. The City of Chaska requested that Xcel Energy consider relocating the transmission line from its current location through the center of town (i.e., Segment 5a) to a location further north and east toward the edge of the city.

The primary difference between the Proposed and Alternative route is that the Proposed Route would require the construction of a new 115 kV transmission line along all new right-of-way, whereas the rebuild alternative would utilize existing transmission line right-of-way. Although the Segment 5a Rebuild Alternative would minimize the need to acquire new right-of-way, it would keep the line within a "cross-country" alignment that currently bisects a large portion of the developed residential and commercial areas near downtown Chaska, including both private and public school facilities, whereas the Proposed Route would relocate the transmission line to a route adjacent to existing transportation corridors (i.e., existing railroad corridor and public roadways).

The total length of the Segment 5a Rebuild Alternative (i.e., rebuilding in the existing alignment along Segment 5a) is 0.39 miles compared to 0.58 miles for the new alignment proposed as Segment 5. Table 5 below compares the percentage of transmission corridor sharing versus cross-country alignment between the Proposed Route Segment 5 and the Segment 5a Rebuild Alternative.

Additionally, a comparison between the Segment 5a Rebuild Alternative and Proposed Route Segment 5 was done for occupied structures. The potential impacts to residential structures are slightly less for Proposed Route Segment 5 than the Segment 5a Rebuild Alternative. With regard to existing structures, a total of 31 residences and 0 commercial businesses are located within 200 feet of the Segment 5a Rebuild Alternative, compared to 25 residences, and 6 commercial businesses within 200 feet of Proposed Route Segment 5. Table 6 compares the distance to occupied structures between Proposed Route Segment 5 with those of the Segment 5a Rebuild Alternative.

TABLE 5
COMPARISON OF TRANSMISSION CORRIDOR SHARING VERSUS
CROSS-COUNTRY ALIGNMENT FOR PROPOSED ROUTE SEGMENT 5 AND
SEGMENT 5a REBUILD ALTERNATIVE

Criteria	Proposed Route Segment 5	Segment 5a Rebuild Alternative		
Length (miles)	0.58	0.39		
Percent of route located "cross-country"	17.25%	76.92%		
Percent of route paralleling existing transportation corridors	82.75%	23.08%		
Percent of route requiring new right-of-way	100%	0%		

TABLE 6
COMPARISON OF DISTANCES TO OCCUPIED STRUCTURES FROM
ANTICIPATED ALIGNMENT ALONG PROPOSED ROUTE SEGMENT 5 VERSUS
SEGMENT 5a REBUILD ALTERNATIVE

Route	Number of Residences within 0-25'	Number of Commercial Operations within 0-25′	Number of Residences within 26-50'	Number of Commercial Operations within 26-50'	Number of Residences within 51-100′	Number of Commercial Operations within 51-100′	Number of Residences within 101-200′	Number of Commercial Operations within 101-200′
Proposed Route Segment 5	0	0	1	0	13	1	11	5
Segment 5a Rebuild Alternative	1	0	4	0	9	0	17	0

Xcel Energy believes that Proposed Route Segment 5 is preferable to the Segment 5a Rebuild Alternative because:

- The Proposed Route maximizes the use of existing transportation corridors compared to the Segment 5a Rebuild Alternative (82.75% vs. 23.08%);
- The Proposed Route minimizes the number of occupied residential structures along the route compared to the Segment 5a Rebuild Alternative; and
- The Proposed Route would relocate the transmission line from the center of the City of Chaska to a location closer to the northeastern edge of the city, as requested by the City of Chaska.

Xcel Energy believes that the Proposed Route along Segment 5 is the best route through the City of Chaska for the reasons discussed above. However, if the Segment 5a Rebuild Alternative is selected by the Commission, Xcel Energy requests a route width of 400 feet to enable the Company to work with the City of Chaska to make improvements to the existing alignment, as necessary.

4.4 SUBSTATION MODIFICATIONS

4.4.1 Scott County Substation

The Scott County Substation (Segment 6) is owned and operated by Xcel Energy. One new 115 kV line termination, including two new 115 kV breakers and associated equipment, such as switches, will be installed. To accommodate the new 115 kV line termination, a new 115 kV yard will be built. An area approximately 240' x 300' to the west of the existing substation will be graded, grounded, and fenced for the new 115 kV yard. The expansion will be onto property owned by Xcel Energy.

New 115 kV steel box structures will be built in the new portion of the substation for the new 115 kV line termination. In order to extend the existing 115 kV in the substation to the new 115 kV yard, strain bus will be brought to the new yard via new transmission type poles. The existing Electrical Equipment Enclosure (EEE) cannot accommodate the new installations. Therefore, a new 24' x 40' EEE will be installed in the new 115 kV yard. A preliminary plan for the Scott County Substation is attached in Appendix F.

The proposed construction activities associated with the Scott County Substation expansion are anticipated to be conducted entirely on active agricultural field. The existing substation

and the proposed expansion site is bounded to the southeast by the Highway 169 corridor. The northeast, northwest, and southwest sides of the substation site are bounded by tilled agricultural lands. Development in the immediate vicinity of the substation site consists of a mix of residential, industrial and agricultural land uses. Residential occupancy consists of a trailer park to the southeast and single family residential to the east and northeast. The remaining surrounding properties are either in agricultural or industrial use. The setting of the Scott County Substation relative to surrounding land uses is presented in Appendix F.

The existing Scott County Substation location and proposed expansion site were included in the general environmental review for the entire project. As exhibited in the Environmental Features Maps (See Appendix B), the substation site is located proximal to, but does not intersect, an MCBS site of biological significance.

4.4.2 Chaska Substation

The Chaska Substation (Segment 5a) is owned and operated by the City of Chaska and will be retired. No modifications to this substation are proposed as part of this Project. Xcel Energy is unaware of the City of Chaska's detailed plans or anticipated timeframe for decommissioning the Chaska Substation.

4.4.3 West Creek Substation

The West Creek Substation (Segment 3a) is owned and operated by the City of Chaska. Xcel Energy will construct and own the 115 kV side of the substation. The 115 kV installations will include steel structures and 115 kV switches. On May 21, 2012, Xcel Energy obtained a conditional use permit from the City of Chaska to construct the 115 kV side of the West Creek Substation and an approximately 0.5-mile 115 kV transmission tap line. This conditional use permit was obtained pursuant to the local review process set forth in Minn. Stat. §216E.05; Minn. R. 7850.5300 (See Appendix G.)

4.4.4 Victoria Substation

The Victoria Substation (Segment 2) is owned and operated by Minnesota Valley Electric Cooperative. To accommodate the transmission line voltage change from 69 kV to 115 kV, the existing 69-12.47 kV transformer will be replaced with a 115-12.47 kV transformer (Appendix F).

The radial transmission line sourcing the Victoria Substation is owned and operated by Great River Energy. Great River Energy will retire the existing 69 kV switch and re-terminate the

line to allow for 115 kV operation. No further changes to the MV-VTT line are needed to serve the converted Victoria Substation.

4.4.5 Augusta Substation

The Augusta Substation (Segment 1) is owned and operated by Minnesota Valley Electric Cooperative. The substation is currently "double-ended," meaning it has two 69-12.47 kV transformers. To accommodate the transmission line voltage change from 69 kV to 115 kV, the existing 69-12.47 kV transformers will be replaced with a single, higher capacity 115-12.47 kV transformer. In addition, the existing 8' x 12' EEE will be replaced with a 15' x 20' EEE and the dead end steel structure inside the substation fence will be retired. Great River Energy's 270 foot radial tap sourcing the Augusta Substation will be re-conductored and reterminated on Xcel Energy's newly rebuilt 115 kV line. The existing 69 kV tap switch will be retired by Great River Energy (Appendix F).

4.5 DESIGN OPTIONS TO ACCOMMODATE FUTURE EXPANSION

The proposed 115 kV transmission lines are designed to meet current and projected needs. The proposed substation modifications are designed to provide for interconnection with proposed, existing, and potential future transmission facilities.

5.0 ENGINEERING DESIGN, CONSTRUCTION AND RIGHT-OF-WAY ACQUISITION

5.1 Structures, Right-of-Way, Construction and Maintenance

5.1.1 Transmission Structures

Steel poles with horizontal or braced post insulators are proposed to be used for the majority of the Project. In instances where the transmission line spans over water or wetlands, H-frame or Y-frame steel structures may be used. Additionally, a cantilever deign may be used in some locations with all davit arms and conductors installed on the side of the pole that overhangs the public road or public right-of-way. Representative photos of the structure types proposed for the Project are shown below in Figure 6.

Portions of the existing 69 kV transmission line through the City of Chaska (Segment 5) have distribution underbuild. In areas of existing distribution underbuild where the transmission line is proposed to be rebuilt in the existing alignment, the distribution underbuild may remain on the rebuilt transmission structures. In areas of existing distribution underbuild where the transmission line will be rebuilt in a new alignment, the City of Chaska anticipates relocating and/or undergrounding their distribution facilities.

The existing 69 kV structures within the Proposed Route are primarily wood pole structures with heights ranging from 50 feet to 90 feet with an approximate average height of 60 feet. All existing 69 kV structures along the Proposed Route will be replaced with new steel 115 kV structures, with the exception of the existing wood pole structures along the Great River Energy MV-VTT line which will remain in place.

The new single pole steel horizontal or braced post 115 kV structures will be approximately 60 to 90 feet tall with spans of approximately 300 to 400 feet. The H-frame or Y-Frame steel structures will be approximately 60 to 105 feet tall with spans of approximately 600 to 1400 feet. This spacing is appropriate to keep the conductor within existing right-of-ways where applicable. Table 7 summarizes specifications for proposed structures. The change from the existing 69 kV wood structures to steel structures along Project Segments 1, 3, 4, 5, and 6 is necessary to support the additional weight of the 115 kV transmission line, provide additional height for electrical clearance, and for improved reliability.

Rock-filled culvert foundations may be required in areas with poor soils. Self-supporting galvanized or self-weathering steel poles with davit arms on drilled pier concrete foundations are proposed to be used for all long span, angle and dead-end structures.

The proposed transmission line will be designed to meet or surpass relevant local and state codes including the National Electric Safety Code ("NESC"), North American Electric Reliability Corporation ("NERC"), and Xcel Energy and Great River Energy standards. Appropriate standards will be met for construction and installation, and applicable safety procedures will be followed during and after installation.

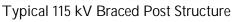
The 115 kV transmission lines will be constructed with 795 kcmil 26/7 Aluminum Conductor Steel Supported ("ACSS").

TABLE 7 STRUCTURE DESIGN SUMMARY

Line Type	Structure Type	Structure Material	Right-of- Way Width (feet)	Structure Height (feet)	Foundation	Foundation Diameter (feet)	Span Between Structures (feet)
115 kV Single Circuit	Single pole, horizontal or braced post insulator	Galvanized or weathering steel	75	60-90	Direct embedded for tangents and self-supporting for angle/ dead-end structures	Direct embedded in 4 foot diameter culvert or 5 to 8 foot concrete	300 to 400
115 kV Single Circuit	H-frame or Y-frame	Galvanized or weathering steel	75	60-105	Direct embedded for tangents and self-supporting for angle/dead- end structures	Direct embedded in 4 foot diameter culvert or 5 to 8 foot concrete	600-1,400

FIGURE 6 PHOTOS OF TYPICAL 115 KV SINGLE CIRCUIT STRUCTURES







Typical 115 kV Horizontal Post Steel Structure



Typical H-Frame Steel Structure



Typical Y-Frame Steel Structure



Typical Single Circuit Structure with Distribution Underbuild

5.1.2 Right-of-Way Width

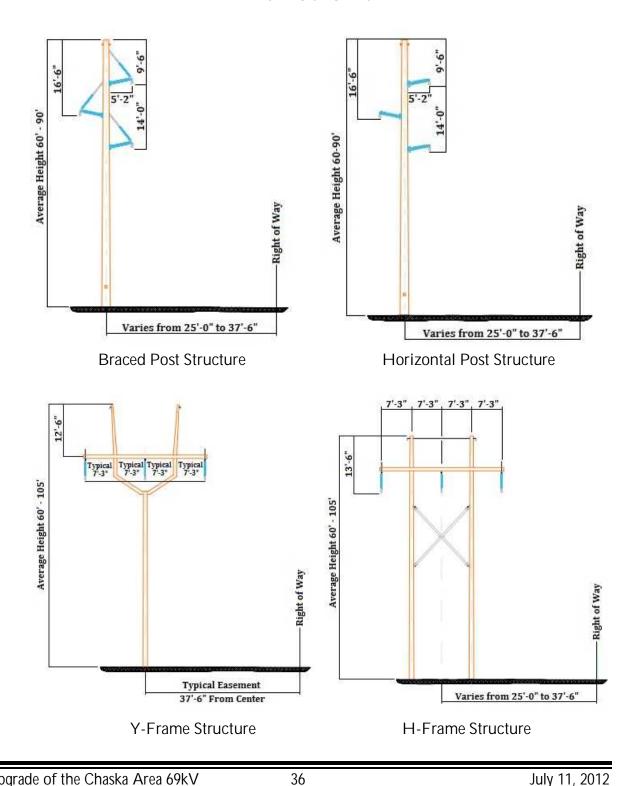
When acquiring new right-of-way for a new 115 kV transmission line, Xcel Energy typically acquires a right-of-way width of up to 75 feet wide. However, Xcel Energy will work within the existing right-of-way (the majority of which is 50-feet wide) for the rebuild portions of the Project whenever practical. When necessary, existing easements may be modified up to a 75-foot width along the rebuild portions of the Project.

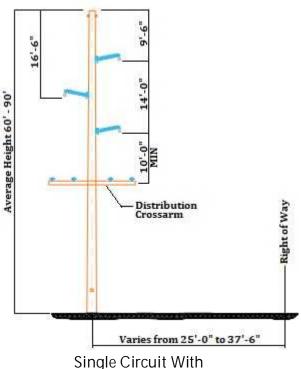
A total of approximately 2.36 miles of new 75-foot-wide right-of-way will be required for segments of new transmission line construction along the Proposed Route. Approximately 1.77 miles of new right-of-way will be needed to construct Segment 3. Additionally, approximately 0.58 miles of new right-of-way will be required along Chaska Blvd, Maple Street and Beech Street within the Chaska city limits to construct Segment 5. The Project segments requiring new right-of-way acquisition are indicated in Appendices A and B

When the line is parallel to a roadway, poles will generally be placed 5 feet within the private right-of-way adjacent to the roadway. Therefore, a little less than half of the line right-of-way will share the existing road right-of-way, resulting in an easement of lesser width being required from the landowner. In general, the structures will be placed as close to the property line as practical.

For the proposed Project, approximately 10 miles of the Project (87%) will be parallel to existing roadways, and approximately 1.5 miles (13%) will be cross country (i.e., Segment 6 across the Minnesota River). Figure 7 shows the pole dimensions and general right-of-way requirements for the Project.

FIGURE 7 TYPICAL DIMENSIONS AND RIGHT-OF-WAY REQUIREMENTS FOR 115 KV **STRUCTURES**





Single Circuit With
Distribution Underbuild

5.1.3 Right-of-Way Evaluation and Acquisition

To the extent new right-of-way acquisition is necessary; the right-of-way agent will work with landowners to determine how to expand existing easements.

For those segments of the Project where new right-of-way will be necessary, the acquisition process begins early in the detailed design phase. For transmission lines, utilities acquire easement rights across certain parcels to accommodate the facilities. The evaluation and acquisition process includes title examination, initial owner contacts, survey work, document preparation and purchase. Each of these activities, particularly as it applies to easements for transmission line facilities, is described in more detail below.

The first step in the right-of-way process is to identify all persons and entities that may have a legal interest in the real estate upon which the facilities will be built. To compile this list, a right-of-way agent or other persons engaged by the utility will complete a public records search of all land involved in the project. A title report is then developed for each parcel to determine the legal description of the property and the owner(s) of record of the property,

and to gather information regarding easements, liens, restrictions, encumbrances and other conditions of record.

After owners are identified, a right-of-way representative contacts each property owner or the property owner's representative. The right-of-way agent describes the need for the transmission facilities and how the Project may affect each parcel. The right-of-way agent also seeks information from the landowner about any specific construction concerns.

The next step in the acquisition process is evaluation of the specific parcel. For this work, the right-of-way agent may request permission from the owner for survey crews to enter the property to conduct preliminary survey work. Permission may also be requested to take soil borings to assess the soil conditions and determine appropriate foundation design. Surveys are conducted to locate the right-of-way corridors, natural features, man-made features and associated elevations for use during the detailed engineering of the line. The soil analysis is performed by an experienced geotechnical testing laboratory.

During the evaluation process, the location of the proposed transmission line or substation facility may be staked with permission of the property owner. This means that the survey crew locates each structure or pole on the ground and places a surveyor's stake to mark the structures or substation facility's anticipated location. By doing this, the right-of-way agent can show the landowner where the structure(s) are anticipated to be located on the property. The right-of-way agent may also delineate the boundaries of the easement area required for safe operation of the line.

Prior to the acquisition of easements or fee purchase of property, land value data will be collected. Based on the impact of the easement or purchase to the market value of each parcel, a fair market value offer will be developed. The right-of-way agent then contacts the property owner(s) to present the offer for the easement and discuss the amount of just compensation for the rights to build, operate and maintain the transmission facilities within the easement area and reasonable access to the easement area. The agent will also provide maps of the line route or site, and maps showing the landowner's parcel. The landowner is allowed a reasonable amount of time to consider the offer and to present any material that the owner believes is relevant to determining the property's value. This step is often performed prior to full evaluation in the form of an "option to purchase" contract and can be very helpful in obtaining permission for completion of all necessary evaluations.

In nearly all cases, utility companies are able to work with the landowners to address their concerns and an agreement is reached for the utility's purchase of land rights. The right-of-way agent prepares all of the documents required to complete each transaction. Some of the documents that may be required include: easement; purchase agreement; contract; and deed.

In rare instances, a negotiated settlement cannot be reached and the landowner chooses to have an independent third party determine the value of the rights taken. Such valuation is made through the utility's exercise of the right of eminent domain pursuant to Minnesota Statutes, Chapter 117. The process of exercising the right of eminent domain is called condemnation.

Before commencing a condemnation proceeding, the right-of-way agent must obtain at least one appraisal for the property proposed to be acquired and a copy of that appraisal must be provided to the property owner. Minn. Stat. § 117.036, subd. 2(a). The property owner may also obtain another property appraisal and the company will reimburse the property owner for the cost of the appraisal according to the limits and requirements set forth in Minnesota Statute § 117.036, Subd. 2(b). The property owner may be reimbursed for reasonable appraisal costs up to \$1,500 for single-family and two-family residential properties, \$1,500 for property with a value of \$10,000 or less, and \$5,000 for other types of properties.

To start the formal condemnation process, a utility files a Petition in the district court where the property is located and serves that Petition on all parties who may have an affected ownership interest in the property. If the court grants the Petition, the court then appoints a three-person condemnation commission that will determine the compensation for the easement. The three people must be knowledgeable of applicable real estate issues. Once appointed, the commissioners schedule a viewing of the property over and across which the transmission line easement is to be located. Next, the commission schedules a valuation hearing where the utility and landowners can testify as to the fair market value of the easement or fee. The commission then makes an award as to the value of the property acquired and files it with the court. Each party has 40 days from the filing of the award to appeal to the district court for a jury trial. In the event of an appeal, the jury hears land value evidence and renders a verdict. At any point in this process, the case can be dismissed if the parties reach a settlement.

As part of the right-of-way acquisition process, the right-of-way agent will discuss the construction schedule and construction requirements with the owner of each parcel. To ensure safe construction of the line, special consideration may be needed for fences, crops or

livestock. For instance, fences may need to be moved, temporary or permanent gates may need to be installed; crops may need to be harvested early; and livestock may need to be moved. In each case the right-of-way agent and construction personnel coordinate these processes with the landowner.

Where the Project is expected to use existing rights-of-way, the right-of-way agent will evaluate all existing easements. If the terms of the existing easement are sufficient and no new right-of-way is needed, the right-of-way agent will continue to work with the landowner to address any construction needs, impacts, damages or restoration issues.

5.1.4 Vegetation Removal Procedures Prior to Construction

The primary objective of the vegetation removal procedure for the Project is to keep transmission facilities clear of tall growing trees, brush, and other vegetation that could grow close to the conductors, and allow construction vehicle access to and between structures. Wherever feasible, Xcel Energy tries to manage vegetation within the right-of-way using the wire zone/border zone concept (*See* Appendix H). This concept generally allows for different, yet compatible, vegetation types in these separate zones. The wire zone, directly beneath the conductors, consists of low growing forbs and grasses. The border zone begins at the outside edge of the wire zone and extends to the edge of the easement. The border zone may contain additional low-growing woody plants and trees. Xcel Energy will attempt to limit vegetation removal along the existing corridor to the extent of what has historically been cut to maintain the current 69 kV line.

As shown on the vegetation management schematic included as Appendix H, Xcel Energy maintains a Hazard Tree Clearing Area on either side of the right-of-way. In addition to the rights to trim or remove vegetation from within the right-of-way, the easement language also provides for removal of trees outside of and immediately adjacent to the right-of-way, which due to their location, height, and condition (i.e., typically dead or dying trees) have the potential to contact or endanger the transmission line by falling on the line. When tree removal is necessary from within the Hazard Tree Clearing Area, Xcel Energy vegetation management personnel will notify the landowner to arrange access and scheduling whenever reasonably practicable.

The following provides a list of general practices Xcel Energy will follow to minimize vegetation impacts related to Project construction:

- Minimize rutting by using matting materials in wetland areas for all construction activities, including right-of-way clearing activities; or perform work on firm or frozen ground that can support the equipment used.
- Minimize soil disturbance in steeply sloped areas, to the extent possible and/or practicable.
- Limit construction activities, including vegetation removal, to the right-of-way and off right-of-way access ways.
- Selectively retain some vegetation within the right-of-way where feasible.
- Limit traffic in the right-of-way between transmission structure locations to a single access path to the extent practicable.
- Use best management practices (BMPs) to minimize the potential for spills or leaks from equipment during construction, including frequent inspections of equipment, requiring portable spill containment kits for construction equipment, ensuring that equipment operators are present at the nozzle at all times when fueling is in progress, and prohibiting the refueling of equipment in wetlands.
- Avoid placement of staging or laydown areas in wetlands, and immediately adjacent to wetlands to the extent practicable.
- Limit staging and lay-down areas to previously disturbed areas where practicable.
- Locate, design, construct, and maintain access paths to minimize rutting, maintain surface and subsurface water flows in the wetland, and reduce erosion and sedimentation.
- Where wetlands are to be crossed, create access through the shortest route within the wetland resulting in the least amount of physical impact to the wetland during construction.
- Assemble structures on upland areas before transporting into wetlands where practicable.
- Use construction mats to minimize impacts within wetlands when construction during winter (frozen) months is not possible.
- Slash or woody vegetation that originates from outside wetlands is not to be left in wetlands. Slash or woody vegetation that originates from outside the wetland is considered unauthorized fill and must be removed.
- To the extent practicable, complete construction in wet organic soils when the ground is frozen.

Site Clean-Up and Restoration

As construction wastes are generated, respective materials will be properly disposed of in a manner which is suitable and appropriate for those wastes. Restoration of the natural landscape will begin as soon as practicable after construction or clearing activities cease. Restoration activities may include:

- Regrading areas disturbed by construction or clearing to reflect pre-construction topography.
- Returning floodplain contours to their pre-construction profile if disturbed during construction.
- Planting or seeding non-agricultural areas disturbed by transmission line structures to
 prevent runoff. Use of native seed mixes from indigenous plants; ensure seeding and/or
 plantings are done at a time congruent with seeding and growth of the area, rather than
 during a time that would preclude germination or rooting.
- Restoring the right-of-way, temporary work spaces, access paths, and other areas of ground disturbance affected by Project construction upon completion of work.

See Section 6.5.5 for a more detailed discussion regarding invasive species management.

Vegetation Removal

The Project will require the clearing of tall vegetation within the right-of-way and clearing of brush along temporary construction access paths. Tall growing vegetation that may interfere with safe construction and safe and reliable operation of the transmission line will not be allowed to persist and will be controlled. In upland areas, woody vegetation will be removed within the right-of-way and managed through the operational life of the Project.

Clearing of vegetation within the right-of-way will occur prior to construction activities as allowed by landowner agreements and permit conditions. Clearing of brush, trees, and herbaceous vegetation to facilitate access and to meet safety standards will occur. Clearing may be accomplished with the use of chainsaws, mowers, and hydraulic tree-cutting equipment. Vegetation will be cut at, or slightly above, the ground surface. Rootstock or stumps will be left in place unless transmission structure installation or construction access requires otherwise.

Landowners will be notified at the earliest possible time to allow them to harvest trees within easement boundaries prior to the initiation of clearing. At the time of clearing, any merchantable trees will be cut to standard logging lengths and stacked in upland areas within the right-of-way. The landowner will retain the title to all timber material. Non-merchantable material, including trees, brush, and slash, will be either cut and scattered, placed in windrow piles, or chipped within the right-of-way. Non-merchantable felled material may also be removed from the right-of-way.

The cut and scatter method may be used in areas where limited clearing will occur in either wetlands or uplands. The purpose of this method is to limit the need for unnecessarily hauling and potentially disturbing existing ground or vegetation. Likely situations where this method will be used are in shrub and brush areas with a limited number of trees. A limited number of trees in shrub wetlands may be disposed of in this way as long as trees that are cut and scattered originate within the wetland. No upland tree material is to be deposited within wetlands as this would constitute wetland fill, which is prohibited.

Woody vegetation may be chipped and scattered over the right-of-way to a maximum depth of one inch in non-agricultural upland areas. Chipping will not occur in wetlands, with the exception of chipped material that is evenly scattered through the use of rubber-tracked blade mowers or ASV Posi-Track mower type equipment used to clear small diameter trees and shrubs.

5.1.5 Transmission Construction Procedures

Construction will begin after all federal, state, and local approvals are obtained, property and rights-of-way are acquired, soil conditions are determined and the design is completed. The precise timing of construction will take into account various requirements that may be in place due to permit conditions, system loading issues, available workforce and materials.

The actual construction will follow standard construction and mitigation practices that have been developed from experience with past projects. These best practices address right-of-way clearance, staging, erecting transmission line structures and stringing transmission lines. Construction and mitigation practices to minimize impacts will be developed based on the proposed schedule for activities, permit requirements, prohibitions, maintenance guidelines, inspection procedures, terrain and other practices. In certain cases some activities, such as schedules, are modified to minimize impacts to sensitive environments.

Typical construction equipment used on transmission projects includes: tree removal equipment, mowers, cranes, backhoes, digger-derrick line trucks, track-mounted drill rigs, dump trucks, front end loaders, bucket trucks, bulldozers, flatbed tractor-trailers, flatbed trucks, pickup trucks, concrete trucks and various trailers. Many types of excavation equipment are set on wheel or track-driven vehicles. Poles are transported on tractor-trailers.

Steel pole structures are proposed to be used for the Project. Steel pole tangent structures are proposed to be directly embedded into the ground if soil conditions warrant. Rock-filled culvert foundations may be required in areas with poor soils. This method typically involves digging a hole for each pole, filling it partially with crushed rock and then setting the pole on top of the rock base. The area around the pole is then backfilled with crushed rock and/or soil. Culvert foundations involve auguring a hole for each pole, installing a galvanized steel culvert, filling the annular space outside the culvert with hole spoils, filling the culvert partially with crushed rock and then setting the pole on top of the rock base. The annular space between the pole and culvert is filled with crushed rock.

Long span, angle and dead end structures along the route will require concrete foundations. In those cases, holes will need to be drilled in preparation for the concrete foundations. Drilled pier foundations may vary from five to eight feet in diameter and 20 to 30 feet deep, depending on soil conditions. Steel reinforcing bars and anchor bolts are installed in the drilled holes prior to concrete placement. Concrete trucks are required to bring the concrete in from a local concrete batch plant. Steel pole structures are hauled unassembled on pole trailers to the staked location and placed within the right-of-way until the pole sections are assembled and the arms attached. Insulators and other hardware are attached while the steel pole is on the ground. The pole is then lifted, placed, and secured on the foundation using a crane.

Construction staging areas are usually established for transmission projects. Staging involves delivering the equipment and materials necessary to construct the new transmission line facilities. Construction of the Project will likely include several staging areas. Structures are delivered to staging areas and materials are stored until they are needed for the Project. The materials are then sorted and loaded onto structure trailers for delivery to the staked location.

In some cases, additional space (temporary lay down areas) may be required. These areas will be selected for their location, access, security and ability to efficiently and safely

warehouse supplies. The areas are chosen to minimize excavation and grading. The temporary lay down areas outside of the transmission line right-of-way will be secured from affected landowners through rental agreements.

Typically, access to the transmission line right-of-way corridor is made directly from existing roads or trails that run parallel or perpendicular to the transmission line right-of-way. In some situations, private field roads or trails are used. Where easements exist, Xcel Energy notifies the property owner that it will access the easement area. Where necessary to accommodate the heavy equipment used in construction, including cranes, concrete trucks and foundation drilling equipment, existing access roads may be upgraded or new roads may be constructed. New access roads may also be constructed where no current access is available or the existing access is inadequate to cross roadway ditches.

Environmentally sensitive areas and wetland areas may also require special construction techniques in some circumstances. During construction, the most effective way to minimize impacts to wet areas will be to span wetlands, streams, and rivers. In addition, Xcel Energy will not allow construction equipment to be driven across waterways except under special circumstances and only after discussion with the appropriate resource agency. Where waterways must be crossed to pull in the new conductors and shield wires, workers may walk across, use boats, or drive equipment across ice in the winter. These construction practices help prevent soil erosion and ensure that equipment fueling and lubricating will occur at a distance from waterways.

Wetlands present within the Proposed Route are dominated by Palustrine or grassland/meadow type wetlands with a lesser number of Lacustrine or open water wetlands. Impacts to wetlands will be minimized through construction practices. Construction crews will maintain sound water and soil conservation practices during construction and operation of the facilities to protect topsoil and adjacent water resources and to minimize soil erosion. Practices may include: containing excavated material, protecting exposed soil, and stabilizing restored soil. Construction crews will avoid major disturbance of individual wetlands and drainage systems during construction by strategically locating new access roads and spanning wetlands and drainage systems where possible.

When it is not feasible to span the wetland, construction crews will consider the following options during construction to minimize impacts:

• When possible, construction will be scheduled during frozen ground conditions;

- Crews will attempt to access the wetland with the least amount of physical impact to the wetland (i.e., shortest route);
- The structures will be assembled on upland areas before they are brought to the site for installation; or
- When construction during winter is not possible, construction mats will be used where wetlands would be impacted.

5.1.6 Post-Construction Restoration Procedures

During construction, crews will attempt to limit ground disturbance wherever possible. However, areas are typically disturbed during the normal course of work, which can take several weeks in any one location. As construction on each parcel is completed, disturbed areas will be restored to their original condition to the maximum extent practicable. The right-of-way agent contacts each property owner after construction is completed to determine whether any damage has occurred as a result of the project.

If damage has occurred to crops, fences or the property, Xcel Energy will fairly reimburse the landowner for the damages sustained. In some cases, Xcel Energy may engage an outside contractor to restore the damaged property to as near as possible to its original condition. Portions of vegetation that are disturbed or removed during construction of transmission lines will naturally reestablish to pre-disturbance conditions. Resilient species of common grasses and shrubs typically reestablish with few problems after disturbance. Areas with significant soil compaction and disturbance from construction activities along the proposed transmission line corridor will require assistance in reestablishing vegetation and controlling soil erosion.

Commonly used methods to control soil erosion and assist in reestablishing vegetation include, but are not limited to:

- Erosion control blankets with embedded seeds;
- Silt fences:
- Hay bales;
- Hydro seeding; and/or
- Planting individual seeds or seedlings of native species.

These erosion control and vegetation establishment practices are regularly used in construction projects and are referenced in the construction storm water permit plans. Long-term impacts are also minimized by utilizing these construction techniques.

See Section 6.5.5 for a more detailed discussion regarding invasive species management.

5.1.7 Maintenance Procedures

Transmission lines and substations are designed to operate for decades and require only moderate maintenance, particularly in the first few years of operation.

The estimated service life of the proposed transmission line for accounting purposes is approximately 50 years. However, practically speaking, high voltage transmission lines are seldom completely retired. Transmission infrastructure has very few mechanical elements and is built to withstand weather extremes that are normally encountered. With the exception of severe weather such as tornadoes and heavy ice storms, transmission lines rarely fail.

Transmission lines are automatically taken out of service by the operation of protective relaying equipment when a fault is sensed on the system. Such interruptions are usually only momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is very high, in excess of 99 percent.

The principal operating and maintenance cost for transmission facilities is the cost of inspections, which is usually done monthly by air. Annual operating and maintenance costs for transmission lines in Minnesota and surrounding states vary. However, past experience shows that costs are approximately \$300 to \$500 per mile for voltages from 69 kV through 345 kV. Actual line-specific maintenance costs depend on the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the line.

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and the NESC requirements. Transformers, circuit breakers, batteries, protective relays, and other equipment need to be serviced periodically in accordance with the manufacturer's recommendations. The substation site must be kept free of vegetation and adequate drainage must be maintained.

5.2 ELECTRIC AND MAGNETIC FIELDS

The term electromagnetic fields ("EMF") refer to electric and magnetic fields that are coupled together such as in high frequency radiating fields. For the lower frequencies associated with power lines, (referred to as "extremely low frequencies" ("ELF")), EMF should be separated into electric fields ("EFs") and magnetic fields, ("MFs"), measured in kilovolts per meter ("kV/m") and milliGauss ("mG"), respectively. These fields are dependent on the voltage of a transmission line (EFs) and current carried by a transmission line (MFs). The intensity of the electric field is proportional to the voltage of the line, and the intensity of the magnetic field is proportional to the current flow through the conductors. Transmission lines operate at a power frequency of 60 hertz (cycles per second).

5.2.1 Electric Fields

There is no federal standard for transmission line electric fields. The Commission, however, has imposed a maximum electric field limit of 8 kV/m measured at one meter above the ground. In the Matter of the Route Permit Application for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota, Docket No. ET-2/TL-08-1474, Order Granting Route Permit (adopting ALJ Findings of Fact, Conclusions and Recommendation at Finding 194 (April 22, 2010 and amended April 30, 2010)) (September 14, 2010). The standard was designed to prevent serious hazards from shocks when touching large objects parked under AC transmission lines of 500 kV or greater. The maximum electric field, measured at one meter above ground, associated with the Project is calculated to be 1.48 kV/m (115 kV single circuit), far below the 8 kV/m maximum imposed by the Commission. The calculated electric fields for the Project are provided in Table 8.

5.2.2 Magnetic Fields

There are presently no Minnesota regulations pertaining to MF exposure. Applicants provide information to the public, interested customers and employees so they can make informed decisions about MFs.

The magnetic field profiles around the proposed transmission lines for each structure and conductor configuration being considered for the Project is shown in Table 9. Magnetic fields were calculated for each section of the Project under peak and average current flows as projected for the year 2013 under normal (system intact) conditions. The peak magnetic field values are calculated at a point directly under the transmission line and where the conductor is closest to the ground. The same method is used to calculate the magnetic field at the edge of the right-of-way. The calculated magnetic fields show that field levels decrease rapidly as

the distance from the centerline increases (proportional to the inverse square of the distance from source).

TABLE 8
CALCULATED ELECTRIC FIELDS (KV/M) FOR PROPOSED 115 KV
TRANSMISSION LINE DESIGNS (ONE METER ABOVE GROUND)

	Maximum	Distance to Proposed Centerline										
Structure Type	Operating Voltage (kV)	-300'	-200'	-100'	-50'	-25′	0'	25′	50'	100'	200'	300'
Horizontal Post 115kV Steel Pole Single Circuit	121	0.01	0.01	0.04	0.15	0.39	1.13	0.51	0.15	0.05	0.01	0.01
Braced Post 115 kV Steel Pole Single Circuit	121	0.01	0.02	0.06	0.19	0.63	1.19	0.49	0.21	0.05	0.01	0.01
H-Frame or Y- Frame 115kV Steel Pole Single Circuit	121	0.00	0.01	0.09	0.52	1.48	0.68	1.48	0.52	0.09	0.01	0.00
Horizontal or Braced Post 115kV Steel Pole Single Circuit (Operated at 69kV)	72.5	0.00	0.01	0.03	0.10	0.23	0.66	0.30	0.10	0.03	0.01	0.00

The magnetic field produced by the transmission line is dependent on the current flowing on its conductors. Therefore, the actual magnetic field when the Project is placed in service is typically less than shown in Table 9. This is because the table represents the magnetic field with current flow at expected normal peak based on projected regional load growth through 2013, the maximum load projection timeline available. Actual current flow on the line will vary, so magnetic fields will be less than peak levels during most hours of the year.

TABLE 9
CALCULATED MAGNETIC FLUX DENSITY (milligauss) FOR PROPOSED 115
KV TRANSMISSION LINE DESIGNS (ONE METER ABOVE GROUND)

Seament						Distanc	Distance to Proposed Centerline						
	Condition	(Amps)	-300′	-200′	-100′	-50′	-25′	<u>0'</u>	25′	50′	100′	200′	300′
Segment 1: West Waconia to	Peak	102	0.15	0.29	0.89	2.65	5.92	11.31	6.27	2.55	0.72	0.19	0.09
Augusta 115kV Single Circuit	Average	61.2	0.09	0.17	0.54	1.59	3.55	6.78	3.76	1.53	0.43	0.11	0.06
Segments 1 & 2: Augusta to	Peak	86	0.13	0.24	0.75	2.23	5.00	9.53	5.29	2.15	0.61	0.16	0.08
MV-VTT 115kV Single Circuit	Average	51.6	0.08	0.14	0.45	1.34	3.00	5.72	3.17	1.29	0.37	0.10	0.05
Segments 3, 4, 5, & 6: West Creek to Scott County 115kV Single	Average	130	0.24	0.53	2.07	7.62	20.22	33.41	20.48	7.80	2.17	0.58	0.27
Circuit Horizontal Post	Peak	78	0.14	0.32	1.24	4.57	12.13	20.04	12.29	4.68	1.30	0.35	0.16
Segments 3, 4, 5, & 6: West Creek to Scott County 115kV Single	Peak	130	0.14	0.28	1.12	3.96	9.63	16.60	8.92	4.10	1.41	0.46	0.25
Circuit Braced Post	Average	78	0.08	0.17	0.67	2.38	5.78	9.96	5.35	2.46	0.85	0.28	0.15

5.2.3 Stray Voltage

Stray voltage (also known as Neutral to Earth Voltage ("NEV") is a condition that can occur on the electric service entrances to structures from distribution lines, not transmission lines. More precisely, stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings, such as barns and milking parlors. Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences. Transmission lines, however, can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line. Appropriate measures will be taken to prevent stray voltage problems in areas where the transmission lines proposed in the Application are parallel to or cross distribution lines.

See Section 6.2.1 for additional information on this subject relating to public health and safety.

5.2.4 Farming, Vehicle Use and Metal Buildings Near Power Lines

Insulated electric fences used in livestock operations can pick up an induced charge from transmission lines. Usually, the induced charge will drain off when the charger unit is connected to the fence. When the charger is disconnected either for maintenance or when the fence is being built, shocks may result. Potential shocks can be prevented by using a couple of methods, including:

- one or more of the fence insulators can be shorted out to ground with a wire when the charger is disconnected; or
- an electric filter can be installed that grounds out charges induced from a power line while still allowing the charger to be effective.

Farm equipment, passenger vehicles and trucks may be safely used under and near power lines. The power lines will be designed to meet or exceed minimum clearance requirements with respect to roads, driveways, cultivated fields and grazing lands specified by the National Electrical Safety Code (NESC).

There is a potential for vehicles under high voltage transmission lines to build up an electric charge. If this occurs, the vehicle can be grounded by attaching a grounding strap to the vehicle long enough to touch the earth. Such buildup is a rare event because generally vehicles are effectively grounded through tires. Modern tires provide an electrical path to ground because carbon black, a good conductor of electricity, is added when they are produced. Metal parts of farming equipment are frequently in contact with the ground when plowing or engaging in various other activities. Therefore, vehicles will not normally build up a charge unless they have unusually old tires or are parked on dry rock, plastic, or other surfaces that insulate them from the ground.

Buildings are permitted near transmission lines but are generally prohibited within the right-of-way itself because a structure under a line may interfere with safe operation of the transmission facilities. For example, a fire in a building on the right-of-way could damage a transmission line. As a result, NESC requirements establish clear zones between transmission facilities and various types of buildings and structures. Metal buildings may have unique issues. For example, metal buildings near power lines of 200 kV or greater must be properly grounded. Any person with questions about a new or existing metal structure, or the applicable NESC clearance requirements for other types of structures on their property can contact the Applicants for further information.

6.0 ENVIRONMENTAL INFORMATION

This section provides a description of the environmental setting, potential impacts and mitigative measures Xcel Energy and Great River Energy have proposed, where applicable, to minimize the impacts of siting, constructing and operating the Project. If the proposed transmission lines were removed in the future, the land could be restored to its prior condition and/or put to a different use. The majority of the measures proposed are part of the standard construction process at Xcel Energy and Great River Energy. Unless otherwise identified in the following text, the costs of the mitigative measures proposed are considered nominal.

6.1 Description of Environmental Setting

The western end of the Proposed Route is located in Dahlgren Township, Carver County, west of Aue Lake at existing structure #142. The Project extends north along the existing Great River Energy MV-VTT line through Laketown Township, and east through the City of Chaska. The Project route continues across the Minnesota River into Jackson Township in Scott County to the eastern terminus of the Project at the Scott County Substation.

The Project is located within the Minnesota and Northeast Iowa Morainal Section (222M), a section within the biogeographic province known as the Eastern Broadleaf Forest Province under the Ecological Classification System ("ECS") developed by the Minnesota Department of Natural Resources ("MnDNR") and the United States Forest Service ("USFS") (MnDNR, 2010). The Project is further located within the Big Woods subsection of the Minnesota and Northeast Iowa Morainal Section, and through the Minnesota River Valley.

Segments 1 through 5 of the Project are significantly disturbed by human activity. Agriculture, development, and settlement have changed the original landscape in much of these areas. Portions of Segment 6, through the Minnesota River valley, retain significant attributes of its original pre-settlement condition. The dominant landscape features in the general area are described as level topped hills bounded by smooth side slopes per the ECS. There are broad level areas between these hills that contain lakes and wetlands, with the area's drainage controlled by the level of these lakes. The topography of this ECS subsection is gently to moderately rolling. The topography of the Proposed Route, however, is relatively level and ranges from 950 feet above mean sea level in elevation in the west to 720 feet above mean sea level as the transmission line route travels to the east and crosses the Minnesota River.

Geologic and topographic information from the MnDNR and the United States Geological Survey ("USGS") was analyzed to determine the existing conditions within the Proposed Route and the potential effects on those conditions.

In Segments 1 through 5, pre-settlement vegetation consisted primarily of oak woodland and maple basswood forest. The majority of Segments 1 through 3 and the western portion of Segment 4 have been converted to primarily agricultural use with only a small portion consisting of either upland forest or wetlands. The eastern portion of Segment 4 and Segment 5 were converted to suburban residential and urban areas. Segment 6, through the Minnesota River floodplain retains a significant portion of its pre-settlement vegetation. The pre-settlement vegetation that has been removed in Segment 6 was a result of agricultural and mining activity. The agricultural areas are utilized mainly for corn and soybean production.

Each segment of the Project crosses or passes near water features. Segment 1 is near Aue Lake and wetlands; Segments 2, 3, 4, and 5 pass over Chaska Creek, its tributaries, wetlands, and Fireman's Clayhole; and Segment 6 crosses the Minnesota River.

6.2 HUMAN SETTLEMENT

6.2.1 Public Health and Safety

The Project will be designed in compliance with local, state, NESC, Xcel Energy and Great River Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and right-of-way widths. Construction crews and/or contract crews will comply with local, state, NESC, Xcel Energy, and Great River Energy standards regarding installation of facilities and standard construction practices. Established Company and industry safety procedures will be followed during and after installation of the transmission lines. This will include clear signage during all construction activities.

The proposed transmission lines will be equipped with protective devices to safeguard the public from the transmission lines if an accident occurs, such as a structure or conductor falling to the ground. The protective devices include breakers and relays located where the line connects to the substation(s). The protective equipment will de-energize the line should such an event occur. Proper signage will be posted warning the public of the risk of coming into contact with the energized equipment.

Electric and Magnetic Fields

Considerable research has been conducted throughout the past three decades to determine whether exposure to power-frequency (60 hertz) magnetic fields causes biological responses and health effects. Epidemiological and toxicological studies have shown no statistically significant association or weak associations between MF exposure and health risks. Public health professionals have also investigated the possible impact of exposure to EMF upon human health for the past several decades. While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields can cause biological responses or health effects continues to be debated.

In 1999, the National Institute of Environmental Health Sciences ("NIEHS") issued its final report on "Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields" in response to the Energy Policy Act of 1992 (Olden, 1999). The NIEHS concluded that the scientific evidence linking MF exposures with health risks is weak and that this finding does not warrant aggressive regulatory concern. However, because of the weak scientific evidence that supports some association between MFs and health effects and the common exposure to electricity in the United States, passive regulatory action, such as providing public education on reducing exposures, is warranted.

In 2007, the World Health Organization ("WHO") concluded a review of the health implications of electromagnetic fields. In this report, the WHO stated:

Uncertainties in the hazard assessment [of epidemiological studies] include the role that control selection bias and exposure misclassification might have on the observed relationship between magnetic fields and childhood leukemia. In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern. (*Environmental Health Criteria Volume N°238 on Extremely Low Frequency Fields* at p. 12, WHO (2007)).

Also, regarding disease outcomes, aside from childhood leukemia, the WHO stated that:

A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include cancers in children and adults, depression, suicide, reproductive dysfunction, developmental

disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease. (*Id.* at p.12.)

Furthermore, in their "Summary and Recommendations for Further Study" WHO emphasized that:

The limit values in [ELF-MF] exposure guidelines [should not] be reduced to some arbitrary level in the name of precaution. Such practice undermines the scientific foundation on which the limits are based and is likely to be an expensive and not necessarily effective way of providing protection. (*Id.* at p. 12).

Although WHO recognized epidemiological studies indicate an association on the range of three to four mG, WHO did not recommend these levels as an exposure limit but instead provided: "The best source of guidance for both exposure levels and the principles of scientific review are international guidelines." *Id.* at pp. 12-13. The international guidelines referred to by WHO are the International Commission on Non-Ionizing Radiation Protection ("ICNIRP") and the Institute of Electrical and Electronic Engineers ("IEEE") exposure limit guidelines to protect against acute effects. *Id.* at p. 12. The ICNIRP-1998 continuous general public exposure guideline is 833 mG and the IEEE continuous general public exposure guideline in 9,040 mG. In addition, WHO determined that "the evidence for a causal relationship [between ELF-MF and childhood leukemia] is limited, therefore exposure limits based on epidemiological evidence is not recommended, but some precautionary measures are warranted." *Id.* at 355-56.

WHO concluded that:

given both the weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukemia, and the limited impact on public health if there is a link, the benefits of exposure reduction on health are unclear. Thus, the costs of precautionary measures should be very low. Provided that the health, social and economic benefits of electric power are not compromised, implementing very low-cost precautionary procedures to reduce exposure is reasonable and warranted. (*Id.* at p. 13).

Wisconsin, Minnesota and California have all conducted literature reviews or research to examine this issue. In 2002, Minnesota formed an Interagency Working Group ("Working Group") to evaluate the body of research and develop policy recommendations to protect the public health from any potential problems resulting from HVTL (High Voltage Transmission Lines) EMF effects. The Working Group consisted of staff from various state agencies and published its findings in a White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options in September 2002, (Minnesota State Interagency Working Group, 2002). The report summarized the findings of the Working Group as follows:

Research on the health effects of EMF has been carried out since the 1970s. Epidemiological studies have mixed results – some have shown no statistically significant association between exposure to EMF and health effects, some have shown a weak association. More recently, laboratory studies have failed to show such an association, or to establish a biological mechanism for how magnetic fields may cause cancer. A number of scientific panels convened by national and international health agencies and the United States Congress have reviewed the research carried out to date. Most researchers concluded that there is insufficient evidence to prove an association between EMF and health effects; however, many of them also concluded that there is insufficient evidence to prove that EMF exposure is safe. (*Id.* at p. 1.)

The Public Service Commission of Wisconsin ("PSCW") has periodically reviewed the science on MFs since 1989 and has held hearings to consider the topic of MF and human health effects. The most recent hearings on MF were held in July 1998. Recently, January 2008, the PSC published a fact sheet regarding MFs. In this fact sheet the PSC noted that:

Many scientists believe the potential for health risks for exposure to EMF is very small. This is supported, in part, by weak epidemiological evidence and the lack of a plausible biological mechanism that explains how exposure to EMF could cause disease. The magnetic fields produced by electricity are weak and do not have enough energy to break chemical bonds or to cause mutations in DNA. Without a mechanism, scientists have no idea what kind of exposure, if any, might be harmful. In addition, whole animal studies investigating long-term exposure to power frequency EMF have shown no connection between exposure and cancer of any kind. (*EMF-Electric & Magnetic Fields*, PSC (January 2008)).

The MPUC, based on the Working Group and World Health Organization findings, has repeatedly found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects." In the Matter of the Application of Xcel Energy for a Route Permit for the Lake Yankton to Marshall Transmission Line Project in Lyon County, Docket No. E-002/TL-07-1407, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Xcel Energy for the Lake Yankton to Marshall Transmission Project at p. 7-8 (Aug. 29, 2008); See also, In the Matter of the Application for a HVTL Route Permit for the Tower Transmission Line Project, Docket No. ET-2, E015/TL-06-1624, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Minnesota Power and Great River Energy for the Tower Transmission Line Project and Associated Facilities at p. 23 (Aug. 1, 2007) ("Currently, there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects.").

The MPUC again confirmed its conclusion regarding health effects and MFs in the Brookings County – Hampton 345 kV Route Permit proceeding ("Brookings Project"). In the Brookings Project Route Permit proceeding, Applicants Great River Energy and Xcel Energy and one of the intervening parties provided expert evidence on the potential impacts of electric and magnetic fields on human health. The ALJ in that proceeding evaluated written submissions and a day-and-half of testimony from these two expert witnesses. The ALJ concluded: "there is no demonstrated impact on human health and safety that is not adequately addressed by the existing State standards for [EF or MF] exposure." In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota, Docket No. ET-2/TL-08-1474, ALJ Findings of Fact, Conclusions and Recommendation at Finding 216 (April 22, 2010 and amended April 30, 2010). The MPUC adopted this finding on July 15, 2010. In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota, Docket No. ET-2/TL-08-1474, Order Granting Route Permit (September 14, 2010).

Mitigative Measures

The Project will be designed in compliance with local, state, NESC, and Xcel Energy and Great River Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and right-of-way widths. The proposed transmission lines will be equipped with protective devices to safeguard the public from the transmission line if an accident occurs, such as a structure or conductor falling to the ground.

6.2.2 Commercial, Industrial, Residential Land Use

Land use within the Proposed Route Segments 1 through 3 are primarily agricultural and undeveloped open space. A review of historic aerial photographs of the Proposed Route indicate a small degree of change in residential, commercial, and industrial occupancy. Aerial imagery dating between 1937 and 2010 suggest that the most significant alteration to the properties within the Proposed Route occurred near the eastern portion of Segment 4 over the past decade (See Appendix J). A residential development was constructed east of the Guardian Angel Cemetery, along the newly established Tupelo Way and Cascade Drive in the northwestern corner of the City of Chaska. The construction was initiated and completed between 2000 and 2006. The remaining portion of Segment 4 and all of Segment 5 remain largely unchanged for decades as developed urban residential and commercial areas of the City of Chaska. Segment 6 through the Minnesota River valley is primarily undeveloped with the exception of some private land parcels in Scott County where agriculture and mining have occurred.

The City of Chaska is the largest city in Carver County, with a population of 23,770 (2010 Census). Most of the proposed new line construction is within Chaska's current city limits. The new line construction proposed in Segment 3 is in a portion of Chaska currently zoned as rural residential. The new construction in Segment 5 is currently zoned for a combination of multi-use, industrial, residential, commercial, public facilities, and open space. Based on interpretation from publically available aerial imagery and preliminary project design plans the closest commercial structure to the Proposed Route is located within Segment 4 and is located 32 feet from the existing 69 kV line near the intersection of Chestnut Street and 6th Street in the City of Chaska (*see* Appendix B.2: Environmental Features Map – Segment 4). The closest residence is also within Segment 4 and is located 39 feet from the existing 69 kV line and is on the north side of Chaska Boulevard, west of the intersection with Chestnut Street.

Classifications of entities noted in the previous sections were determined by digitizing current aerial photographs and then categorizing structures into "residential" and "commercial" by using a combination of Google Street Maps and aerial photo interpretation. Distance estimates to any identified residential or commercial structures are based on visual interpretation of the available data. Estimates are based on estimated shortest distances between residential or commercial structure and the proposed transmission route. The numbers of occupied structures located within various distances from the anticipated alignment are shown in Table 10 below.

Mitigative Measures

The Project will be designed in compliance with local, state, NESC, and Xcel Energy and Great River Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials and right-of-way widths. The proposed transmission lines will be equipped with protective devices to safeguard the public from the transmission line if an accident occurs, such as a structure or conductor falling to the ground. As discussed in Section 5.1.1, a cantilever structure design may be used in some locations to increase the distance from the conductors to nearby residences or buildings.

TABLE 10
DISTANCE TO OCCUPIED STRUCTURES

Segment	Number of Farmsteads or Residences within 0- 25' of Anticipated Alignment	Number of Commercial Operations within 0- 25' of Anticipated Alignment	Number of Farmsteads or Residences within 26- 50' of Anticipated Alignment	Number of Commercial Operations within 26- 50' of Anticipated Alignment	Number of Farmsteads or Residences within 51- 100′ of Anticipated Alignment		Number of Farmsteads or Residences within 101- 200′ of Anticipated Alignment	Number of Commercial Operations within 101- 200' of Anticipated Alignment
1	0	0	0	0	1	0	9	0
2	0	0	0	0	2	0	2	1
3	0	0	0	0	1	0	0	0
4	0	0	3	2	8	0	28	5
5	0	0	0	0	12	1	13	5
6	0	0	0	0	0	0	0	1
Total	0	0	3	2	24	1	52	12

6.2.3 Displacement

No displacement of residential homes or businesses will occur as a result of this Project. The NESC and Xcel Energy's standards require certain clearances between transmission line facilities and buildings for safe operation of the proposed transmission line. Xcel Energy will acquire a right-of-way for the transmission line that is sufficient to maintain these clearances.

Mitigative Measures

Because no displacement will occur, no mitigative measures are proposed.

6.2.4 Noise

Transmission Line Noise

Transmission lines can generate a small amount of sound energy during corona activity where a small electrical discharge caused by the localized electric field near energized components and conductors ionizes the surrounding air molecules. Corona is the physical manifestation of energy loss, and can transform discharge energy into very small amounts of sound, radio noise, heat, and chemical reactions of the air components. Several factors, including conductor voltage, shape and diameter, and surface irregularities such as scratches, nicks, dust, or water drops can affect a conductor's electrical surface gradient and its corona performance.

Noise emission from a transmission line occurs during certain weather conditions. In foggy, damp, or rainy weather, power lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires. During heavy rain, the background noise level of the rain is usually greater than the noise from the transmission line. As a result, people do not normally hear noise from a transmission line during heavy rain.

Since human hearing is not equally sensitive to all frequencies of sound, the most noticeable frequencies of sound are given more "weight" in most measurement schemes. The A-weighted scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA, which is the A-weighted sound level recorded in units of decibels.

A noise level change of 3 dBA is barely perceptible to human hearing. A 5 dBA change in noise level, however, is clearly noticeable. A 10 dBA change in noise level is perceived as a doubling of noise loudness, while a 20 dBA change is considered a dramatic change in loudness. Table 11 below shows noise levels associated with common, everyday sources.

In Minnesota, statistical sound levels (L Level Descriptors) are used to evaluate noise levels and identify noise impacts. The L_5 is defined as the noise level exceeded 5% of the time, or for three minutes in an hour. The L_{50} is the noise level exceeded 50% of the time, or for 30 minutes in an hour.

TABLE 11
COMMON NOISE SOURCES AND LEVELS

Sound Pressure Level (dBA)	Noise Source
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library
40	Bedroom
30	Secluded Woods
20	Whisper

Source: Minnesota Pollution Control Agency (2008).

Land areas, such as picnic areas, churches, or commercial spaces, are assigned to an activity category based on the type of activities or use occurring in the area. Activity categories are then categorized based on their sensitivity to traffic noise. The Noise Area Classification ("NAC") is listed in the MPCA noise regulations to distinguish the categories. Residential areas, churches, and similar type land use activities are included in NAC 1; commercial-type land use activities are included in NAC 3.

Table 12 identifies the MPCA established daytime and nighttime noise standards by NAC. The standards are expressed as a range of permissible dBA within a one hour period; L_{50} is the dBA that may be exceeded 50 percent of the time within an hour, while L_{10} is the dBA that may be exceeded 10 percent of the time within the hour.

TABLE 12 NOISE STANDARDS BY NOISE AREA CLASSIFICATION (dBA)

	Dayt	ime	Nighttime		
Noise Area Classification	L ₅₀	L ₁₀	L ₅₀	L ₁₀	
1: Residential-type Land Use Activities	60	65	50	55	
2: Commercial-type Land Use Activities	65	70	65	70	
3: Industrial-type Land Use Activities	75	80	75	80	

Approximately 94 residences and businesses are located within 200 feet of the Proposed Route. Of these structures, 31 are located along new construction portions of the Project (Segments 3 and 5) and 63 are located along upgrade and conversion segments of the Project (Segments 1, 2, 4, and 6). The closest distance that a residence is located to the proposed new 115 kV line construction is approximately 54 feet (Segment 5). The closest distance that a residence is located to a proposed transmission line upgrade is approximately 39 feet (Segment 4). Both are located within the City of Chaska.

Noise levels produced by a 115 kV transmission line are generally less than outdoor background levels and are therefore not usually audible. Therefore, noise levels from the new line and single circuit line upgrade should not be noticeably greater than existing levels.

The EPRI "Transmission Line Reference Book, 345 kV and Above" Chapter 6, provides empirically-derived formula for predicting audible noise from overhead transmission lines. Computer software produced by the Bonneville Power Administration (BPA) (BPA, 1977) is also frequently used to predict the level of audible noise from power transmission lines that is associated with corona discharge. Audible noise is predicted for dry and wet conditions, with wet conditions representing a worst case. These procedures are considered to be reliable and represent International best practice.

The Project consists of new and rebuild segments of 115 kV single circuit transmission line. Computer modeling performed by Xcel Energy using the BPA 1977 software under the worst case wet conditions scenario indicated that the audible L5 and L50 noise levels (discussed below) measured at the edge of the 75-foot-wide right-of-way (37.5 feet from centerline) would be at 22.2 and 18.7 dBA, respectively, well below the MPCA nighttime L50 limit of 50 dBA for Noise Area Classification 1. These findings are shown in Table 13.

TABLE 13
CALCULATED AUDIBLE NOISE (dBA) FOR PROPOSED 115 KV
TRANSMISSION LINE DESIGNS (3.28 FEET ABOVE GROUND)

Structure Type	Noise L5 (37.5 Feet From Centerline) (Decibels A- weighted)	Noise L50 (37.5 feet From Centerline) (Decibels A-weighted)
Horizontal or Braced Post 115kV Steel Pole Single Circuit	22.2	18.7
Y-Frame or H-Frame 115kV Steel Pole Single Circuit	17.9	14.4
Horizontal or Braced Post 115kV Steel Pole Single Circuit (Operated at 69kV)	4.6	1.1

Transformer Substation Noise

Transformer "hum" is the dominant noise source at substations. Transformer hum is caused by magnetostrictive forces within the core of the transformer. These magnetic forces cause the core laminations to expand and contract, creating vibration and sound at a frequency of 100Hz (twice the a.c. mains frequency), and at multiples of 100Hz (harmonics). Typically, the noise level does not vary with transformer load, as the core is magnetically saturated and cannot produce any more noise.

The nearest occupied home to the Augusta Substation is located approximately 215 feet to the east. The nearest non-residential structure to the Augusta Substation is located greater than a mile from the substation. The new transformer specifications requested for this substation design will result in noise levels equal to or less than what exists today.

The nearest occupied home to the Victoria Substation is located approximately 715 feet to the south and east. The nearest non-residential structure to the Victoria Substation is located greater than one mile from the substation. The new transformer specifications requested for this substation design will result in noise levels equal to or less than what exists today.

The structural features closest to the Scott County Substation are a gravel pit 900 feet to the west and a mobile home park approximately 380 feet to the southeast (across Highway 169). No change in noise levels to this substation are expected from the Project.

Mitigative Measures

No noise impacts are anticipated; therefore, no mitigative measures are proposed.

6.2.5 Television and Radio Interference

Corona from transmission line conductors can generate electromagnetic "noise" at the same frequencies that radio and television signals are transmitted. This noise can cause interference with the reception of these signals depending on the frequency and strength of the radio and television signal. Tightening loose hardware on the transmission line usually resolves the problem.

If radio interference from transmission line corona does occur, satisfactory reception from AM radio stations previously providing good reception can be restored by appropriate modification of (or addition to) the receiving antenna system. AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly within the right-of-way to either side.

FM radio receivers usually do not pick up interference from transmission lines because:

- Corona-generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band (88-108 Megahertz); and
- The excellent interference rejection properties inherent in FM radio systems make them virtually immune to amplitude type disturbances.

A two-way mobile radio located immediately adjacent to and/or behind a large metallic structure (such as a steel tower) may experience interference because of signal-blocking effects. Movement of either mobile unit so that the metallic structure is not immediately between the two units should restore communications. This would generally require a movement of less than 50 feet by the mobile unit adjacent to a metallic tower.

Television interference is rare but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. Loose and/or damaged hardware may also cause television interference. If television or radio interference is caused by or from the operation of the proposed facilities in those areas where good reception is presently obtained, Xcel Energy will inspect and repair any loose or damaged hardware in the transmission line, or take other necessary action to restore reception to the

present level, including the appropriate modification of receiving antenna systems if deemed necessary.

Mitigative Measures

If radio or television interference occurs due to the Project, the Applicants will work with the affected landowner to restore reception to pre-Project quality.

6.2.6 Aesthetics

The proposed Project route will mainly follow existing 69 kV transmission line routes for Segments 1, 2, 4 and 6 and therefore, the Project will not result in a significant change to the visual and aesthetic character of the area. In Project segments involving rebuilding the existing line (Segments 1, 4, and 6), existing poles will be removed and replaced in generally the same location. Segment 2 involves only a change to the operating voltage of the existing line and does not involve any physical modifications. The existing transmission line structures vary in height between 50 to 90 feet. By comparison, the proposed transmission line structures will generally be slightly taller, ranging from 60 to 105 feet in height. The overall spacing of the poles will be comparable to the current layout, which varies greatly by engineering and land use constraints.

In Project segments involving new construction (Segments 3 and 5), the transmission line will be a new feature visible along the route. The structures will be about 60 to 105 feet tall and will have an average span of 325 feet. A maximum span will be used between the structures as necessary while still keeping the conductor within the right-of-way under blowout conditions. The typical right-of-way required for 115 kV single circuit structures is 75 feet wide.

The finish of the proposed poles will be either galvanized steel or self-weathering steel. The existing transmission line structures in this area are a mix of wood poles, steel poles and some H-frame construction. The galvanized steel poles give the transmission line a somewhat cleaner and more modern appearance, while self-weathering steel poles have a greater propensity to blend in with wooded areas.

The majority of the transmission line structures along the Proposed Route will be single pole design similar to the existing transmission line in the area. However, along Project segments involving upgrade or new construction, the structures will be steel rather than wood resulting in a slight change in appearance. The proposed structure specifications are described in detail in Section 5.1.

Like the existing 69 kV transmission line, the new and rebuild segments of 115 kV single circuit transmission line will be visible throughout the general area surrounding the Proposed Route. The landscape in the vicinity of the Proposed Route is a mix of rural residential development, agricultural land, open space, and urban commercial and residential development. The visual effect will depend largely on the perceptions of the observers across these various landscapes. The visual contrast added by the transmission structures and lines may be perceived as a visual disruption or as points of visual interest. The transmission lines and substations that already exist in the vicinity of the proposed Project will limit the extent to which the new line construction and upgraded transmission line is viewed as a disruption to the area's scenic integrity.

Mitigative Measures

To minimize impacts to the aesthetics and visual character of the area surrounding the Proposed Route, Applicants have identified a Proposed Route that predominantly uses existing transmission line and road corridors and avoids residences and businesses to the greatest extent practicable. The Applicants will work with landowners to identify concerns related to the transmission line aesthetics.

6.2.7 Socioeconomic

Population and economic characteristics based on the 2010 U.S. Census are presented in Table 14 below.

According to 2010 US Census data, Carver County had a population consisting of 92.8 percent Caucasian, and Scott County had a population consisting of 77 percent Caucasian. In the vicinity of the Proposed Route, minority groups constitute a range of 1.6% to 34.22% of the total population.

Per capita incomes within the townships intersected by the Proposed Route are slightly lower when compared to Carver and Scott counties on a whole. The vicinity of the Proposed Route does not contain disproportionately high minority populations or low-income populations.

Approximately 8 to 12 workers will be required by Xcel Energy for transmission line construction. The transmission crews are expected to spend approximately 6 months constructing the project.

TABLE 14
POPULATION AND ECONOMIC CHARACTERISTICS

Location	Population	Minority Population (Percent)	Caucasian Population (Percent)	Per Capita Income	Percentage of Individuals Below Poverty Level
State of Minnesota	5,303,925	14.7	85.3	\$29,582	10.6
Carver County	91,042	7.2	92.8	\$35,807	4.7
City of Chanhassen	22,952	7.5	92.5	\$44,080	2.9
City of Chaska	23770	11.9	88.1	\$33,600	7.5
Dahlgren Township	1,331	1.6	98.4	\$36,468	4.9
Carver City	3,724	11.5	88.5	\$35,381	5.0
Laketown Township	2,243	7.0	93.0	\$39,218	3.9
Scott County	129,928	13.6	86.4	\$33,612	4.7
Jackson Township	1,464	34.22	65.78	\$27,372	3.6
Shakopee City	37,076	23.0	77.0	\$30,908	6.3

Source: 2010 U.S. Census: General Demographic Characteristics

There will be short-term influx of contractor employees during construction of the various segments of the Project. Both utility personnel and contractors will be used for construction activities. The communities near the Project may experience short-term positive economic impacts through the use of hotels, restaurants, and other services by the various workers.

It is not expected that additional permanent jobs will be created by the Project. The construction activities will provide a seasonal influx of economic activity into the communities during the construction phase, and materials such as concrete may be purchased from local vendors. Long-term beneficial impacts from the Project include increased local tax base resulting from the incremental increase in revenues from utility property taxes.

Socioeconomic impacts resulting from the Project will be primarily positive with an influx of wages and expenditures made at local businesses during the construction of the Project, increased tax revenue and increased opportunities for business development.

Mitigative Measures

No socioeconomic impacts are anticipated; therefore, no mitigative measures are proposed.

6.2.8 Cultural Values

Cultural values include those perceived community beliefs or attitudes in a given area, which provide a framework for community unity. According to the U.S. Census Bureau, the populations of both counties derive from a diverse ethnic heritage. However, a majority of the reported ethnic backgrounds are of European origin. In Carver County, German and Scandinavian heritage comprises 76% of the total population, with German heritage being the most prevalent with nearly 50%. Scott County has a similar German and Scandinavian ethnic representation at 70%, with German heritage being nearly 45%. The region surrounding the Proposed Route has cultural values tied to the area's strong German and Scandinavian heritage, and the agricultural and industrial economy. Cultural representation in community events appears to be more closely tied to geographic features (such as the Minnesota River), seasonal events, national holidays, and municipal events than to those based in ethnic heritage. Examples of regional cultural events include the annual River City Days held in July in Chaska, Derby Days held every August and the Happy Birthday America parade held every July in Shakopee.

Construction of the proposed Project is not expected to conflict with the cultural values of the area.

Mitigative Measures

No impacts to cultural values are anticipated and therefore, no mitigative measures are proposed.

6.2.9 Recreation

The Proposed Route crosses four municipalities, including from west to east: Dahlgren Township, Laketown Township, and the City of Chaska, all within Carver County; and Jackson Township within Scott County. A total of five parks intersect or abut the route width of the Project. The municipality and uses of the five identified parks are summarized in Table 15. The Project is not expected to directly impact any of these recreational resources with the exception of Fireman's Park I. Construction activities associated with the Project near these parks consist of upgrades to existing transmission infrastructure, which is already located in established, cleared rights-of way, so no additional vegetation removal or use restrictions should occur in the parks as a result of the Project. A portion of the new line through the City of Chaska (Segment 5) will be constructed near Fireman's Park I. The construction of the new line will require some vegetation and tree removal, which may result in an aesthetic change for the park; however, it is unlikely the Project will have any impact on the recreational use of the park.

All parks, recreational areas, and preserves located within one mile of the Proposed Route were also identified and are summarized in Table 16. No impacts to these parks and recreation areas are anticipated as a result of the Project.

TABLE 15
RECREATION AREAS LOCATED WITHIN THE ROUTE WIDTH

			Park Amenities												
Park	Municipality	Trail Access	Shelter	Picnic Areas	Restrooms	Public Swimming	Fishing	Boat Access	Play Equipment	Ball Fields	Tennis Courts	Volleyball	Basketball	Horseshoes	Skating & Hockey
Schimelpenig Park	Chaska	Χ	Χ	Χ	Χ		Χ		Χ			Χ	Χ	Χ	
Firemans Park I	Chaska	Х	Х	Х	Х	Х	Х		Х	Χ		Х			
Firemans Park II	Chaska			Х					Х						Χ
Highland Park	Chaska								Х						
Minnesota Valley State Recreational Area	Jackson Township	Х		Х	Х		Х	Х							

TABLE 16 RECREATION AREAS LOCATED WITHIN ONE MILE OF THE PROPOSED ROUTE

Municipality	Area Name
Dahlgren Township	Augusta Ball Club
City of Carver	Minnesota Valley National Wildlife Refuge
City of Chaska	Athletic Park, Chaska Town Course, City Square Park, Community Center Park, Community Park, Firemen's Park I, Firemen's Park II, Friendship Park, Griep Park, Hickory Park, Highland Park, Kelzer Park, Lions Park, Meadow Park, Minnesota Valley National Wildlife Refuge, Schalow Park, Schimelpfenig Park, Winkel Park, and 33 areas of Open Space
Jackson Township	Minnesota Valley State Recreation Area, Nyssen's Lake Unit
City of Shakopee	Tahpah Park

A total of 15 bikeways intersect the Proposed Route along its length. In general, bikeways are a combination of established roadways and paved recreational trails. Dedicated recreational trails include the Minnesota Valley State Trail which intersects the east end of the Proposed Route approximately ½ mile north of the Scott County Substation. There are two proposed regional trails near the Proposed Route: the Twin Cities & Western trail and the Chaska-Victoria trail. The Proposed Route intersects these proposed regional trails at two locations: one within the City of Chaska near the intersection of 6th Street and Chestnut Street (Segment 4), and another in Laketown Township along Guernsey Avenue north of Engler Blvd. (Segment 2).

Mitigative Measures

The Project will be visible from Aue Lake, Fireman's Clayhole, Courthouse Clayhole, and the Minnesota River, however direct impact to these resources is not expected. If impacts to these resources are encountered during construction of the Project, Applicants will work with the appropriate representatives to minimize impacts.

Impacts to the existing bike trails or any of the proposed trails are anticipated to be limited to temporary access issues associated with construction activities. Any anticipated impacts on the proposed trails will be discussed with the appropriate governing authorities to determine means of minimizing or avoiding impacts. Any physical impacts derived from construction activities will be restored to pre-construction conditions.

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6.2.10 Public Services and Transportation

The City of Chaska provides water, sewer and electrical service to its residents. Outside the city limits, along the transmission route, private wells and septic systems are used. Based on comments provided by City staff, no public utility or road improvement projects are currently planned for the area near the existing Xcel Energy transmission line within the City of Chaska. The Project is not expected to directly impact public services to area residents.

According to the Carver County Capital Improvement Plan (CCCIP) for 2012 to 2016, future road projects within the general area of the Project include the County State Aid Highway (CSAH) 13/Trunk Highway (TH) 5 Turn Lane and CSAH 11/TH 5 Turn Lane project slated for the 2012 construction year, and corridor construction on CSAH 18 from the intersection of CSAH 13 to 0.3 miles west of TH 41 for the 2013 construction year. According to the CCCIP, the CSAH 10 (Engler Blvd.) reconstruction from CSAH 11 to TH 212 and corridor construction of CSAH 14 from Bavaria Road to TH 41 are both slated for the 2016 construction year, but are currently unfunded.

MnDOT and Carver County are in the process of securing permits for the CSAH 11 road project between CSAH 61 (Chaska Boulevard) and CSAH 10 (Engler Boulevard). The project consists of the realignment and reconstruction of an approximately two mile segment of CSAH 11 to provide a continuous two-lane roadway between CSAH 61 and CSAH 10. Between CSAH 61 and CR 140, improvements will be made to bring the corridor to current design standards. Between CR 140 and CSAH 10, CSAH 11 will be reconstructed along a new alignment to eliminate two existing intersections along CR 140.

Construction projects currently underway consist of new traffic signals and turn lane construction and resurfacing at the intersection of CSAH 11 and CSAH 61 in the City of Chaska. Ongoing and future road projects within the general area are not anticipated to affect the planning or construction of the proposed transmission line upgrade Project.

Mitigative Measures

Minimal to no impacts to public services are anticipated to occur as a result of the proposed Project. Xcel Energy will coordinate with Carver County to coordinate structure placement with the reconstruction project proposed for CSAH 11 between CSAH 61 and CSAH 10 (Engler Blvd.) Based on the proposed CSAH 11 project, no significant conflicts with the Project are anticipated. Future planning for state highway improvement or re-alignments is expected to be negotiated under MnDOT's Accommodation Policy. Transmission line planning will be conducted in accordance with MnDOT policies.

6.3 LAND-BASED ECONOMIES

6.3.1 Agriculture

Carver County has a strong economic dependence on agricultural production. According to the 2007 United States Department of Agriculture ("USDA") Census of Agriculture, Carver County has 800 individual farms, marking a 2% decrease in total number of farms over the previous five years. Agricultural lands cover 169,397 acres, representing over 70% of all lands in Carver County with an average farm size of 212 acres. Carver County ranks among the top 20 counties (by value of sales) in production of fruits, tree nuts, and berries (ranking 15th statewide); nursery, greenhouse, floriculture, and sod (ranking 10th statewide); and milk and other bovine dairy products (ranking 13th statewide). Nearly \$93 million was generated from both crop and livestock sales in 2007.

Scott County has moderate economic dependence on agricultural production. According to the 2007 USDA Census of Agriculture, Scott County has 795 individual farms, marking a 21% decrease in total number of farms over the previous five years. Agricultural lands cover 117,551 acres, representing over 51% of all land in Scott County with an average farm size of 148 acres. Scott County ranks among the top twenty counties (by value of sales) in production of fruits, tree nuts, and berries (ranking 5th statewide); cut Christmas trees and short rotation woody crops (ranking 6th statewide); and horses, ponies, mules, burros, and donkeys (ranking 13th statewide). Over \$63 million was generated from both crop and livestock sales in 2007.

Construction activities associated with the Project will temporarily access areas of agricultural land. The determination of precise acreage of the temporary access is dependent upon final engineering design. The acreage anticipated to be included in temporary construction access points is comprised of numerous small agricultural properties in the vicinity of the Proposed Route. Construction of new transmission structures and removal of existing structures will require repeated access to structure locations to install foundations, structures and conductors. Equipment used in the construction process includes drill rigs, concrete trucks, backhoes, cranes, boom trucks and assorted small vehicles. Operation of these vehicles on adjoining farm fields can cause rutting and compaction, particularly during springtime and otherwise wet conditions.

Mitigative Measures

Landowners will be compensated for the use of their land through easement payments.

Xcel Energy construction crews will work with the property owner, right-of-way agent, and transmission line engineers to minimize impacts on agricultural property to the maximum extent practicable.

6.3.2 Forestry

There are no forested areas along the Proposed Route where trees are harvested; the primary tree cover in the area is associated with waterways and homesteads. No economically significant forestry resources are located along the proposed transmission line rebuild or new construction routes.

Mitigative Measures

No impacts to forestry resources are anticipated and therefore, no mitigative measures are proposed.

6.3.3 Tourism

Primary tourism activities in the region include camping, fishing, boating, bicycling, and cross country skiing. The Minnesota River Valley offers multiple opportunities for outdoor recreation. Popular tourist attractions located in Scott County include the Minnesota Renaissance Festival, Mystic Lake Casino, and the Valleyfair Amusement Park.

Mitigative Measures

No impacts to tourism are anticipated and therefore, no mitigative measures are proposed.

6.3.4 Mining

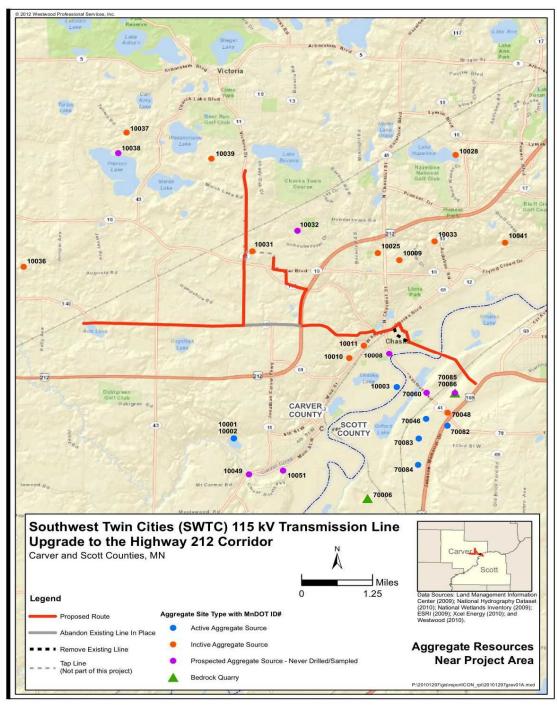
According to MnDOT county pit maps for Carver and Scott counties, there are gravel pits, rock quarries and commercial aggregate sources in the vicinity of the Proposed Route (Figure 8). Of these, the closest is an inactive aggregate source located north of Engler Blvd. on Segment 2 and an active gravel pit and rock quarry located near Segment 6, approximately 0.35 miles from the eastern terminus of the Project in Scott County. Three active aggregate sources and four inactive sources are located within one mile of the Project. Four inactive gravel pits are within one mile of the Project. Because no existing gravel and rock resources are being utilized within the Proposed Route, no impacts are anticipated.

Mitigative Measures

No impacts to mining operations are anticipated and therefore, no mitigative measures are proposed.

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FIGURE 8
AGGREGATE RESOURCES NEAR THE PROPOSED ROUTE



6.4 Archaeological and Historical Resources

A review of records at the Minnesota State Historic Preservation Office ("SHPO") and the Minnesota Office of the State Archaeologist ("OSA") conducted in February 2011 identified a total of 293 previously recorded cultural resource properties located within a one-mile buffer of the Proposed Route, including 20 archaeological sites and 273 inventoried historic architectural properties. A summary of the inventoried cultural resources is provided in Appendix I.

Of the 20 archaeological sites, nine consist of prehistoric artifact or lithic scatters, two are single artifact finds, five are records based on historical documentation, and four are earthworks (which may or may not contain burials) (Appendix I.1). One of the archaeological sites, Site 21CR0002- an earthwork, has been listed on the National Register of Historic Places (NRHP). Of the 273 historic architectural resources identified in the records review, 32 are listed on the National Register of Historic Places (NRHP) and three are Considered Eligible Findings (CEF) by the SHPO (Appendix I.2).

Of the 293 cultural resource properties located within one mile of the Proposed Route, 43 of the identified properties are located within the Proposed Route width (i.e., 200' for rebuild segments or 400' for new construction segments). Segments 1, 4, and 6 have no documented cultural resources properties identified within the one-mile buffer. Segment 2 has four identified cultural resource properties. Segment 3 has one identified cultural resource property. Segment 5 has thirty-seven identified cultural resource properties within the City of Chaska. Of the 43 properties located within the route width, none have been formally evaluated or considered for eligibility for listing on the National Register of Historic Places. None of the historic architectural resources will be directly impacted by construction of the Project. Three of the archaeological sites (21CR0101, 21SC0026, and 21SC0091) are within the Proposed Route but are external to the anticipated alignment and are not likely to experience direct impacts resulting from the construction of the Project. The proposed construction will primarily constitute the replacement of pre-existing features and new indirect visual impacts will be minimal.

Mitigative Measures

The proposed Project will avoid impacts to identified archaeological and historic architectural resources to the extent possible. The requested route width will allow flexibility for final design of the alignment and structure placement to avoid the three identified archaeological sites. Should a specific impact be identified, Applicants will consult with SHPO on whether the resource is eligible for listing in the NRHP. While avoidance would be a preferred action,

mitigation for Project-related impacts on NRHP-eligible archaeological and historic resources may include resource investigations and/or additional documentation through data recovery.

6.5 NATURAL ENVIRONMENT

6.5.1 Air Quality

Potential air quality effects related to transmission facilities include fugitive dust emissions during construction, exhaust emissions from construction equipment and ozone generation during transmission line operation (Jackson et al., 1994). All of these potential effects are considered to be relatively minor, and all but the ozone effects are short-term.

Corona consists of the breakdown or ionization of air within a few centimeters of conductors. Usually some imperfection such as a scratch on the conductor or a water droplet is necessary to cause corona. Corona can produce ozone and oxides of nitrogen in the air surrounding the conductor. Ozone also forms in the lower atmosphere from lightning discharges, and from reactions between solar ultraviolet radiation and air pollutants, such as hydrocarbons from auto emissions. The natural production rate of ozone is directly proportional to temperature and sunlight, and inversely proportional to humidity. Thus, humidity or moisture, the same factor that increases corona discharges from transmission lines, inhibits the production of ozone. Ozone is a very reactive form of oxygen molecules and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short lived.

State and federal governments currently regulate permissible concentrations of ozone (0_3) and nitrogen oxides (NO_x) . Ozone forms in the atmosphere when nitrogen oxides and volatile organic compounds react in the presence of heat and sunlight. Air pollution from cars, trucks, power plants and solvents contribute to the concentration of ground-level ozone through these reactions. The national ozone standard is 0.075 parts-per-million (ppm) during an eight-hour averaging period. The state ozone standard is 0.08 ppm based upon the fourth-highest eight-hour daily maximum average in one year. Both averages must be compared to the national and state standards because of the different averaging periods. Calculations done for a 345 kV project showed that the maximum one hour concentration during foul weather (worst case) would be 0.0007 ppm. This is well below both the federal and state standards. Lower voltage lines would have correspondingly lower concentrations. Most calculations of the production and concentration of ozone assume high humidity or rain, with no reduction in the amount of ozone due to oxidation or air movement. These

calculations would therefore overestimate the amount of ozone that is produced and concentrated at ground level. Studies designed to monitor the production of ozone under transmission lines have generally been unable to detect any increase due to the transmission line facility.

Minor temporary effects on air quality are anticipated during construction of the proposed line rebuild as a result of exhaust emissions from construction equipment and other vehicles, and from fugitive dust that becomes airborne during dry periods of construction activity.

The magnitude of air emissions during construction is influenced by weather conditions and the type of construction activity. Exhaust emissions, primarily from diesel equipment, will vary with the phase of construction. Adverse effects on the surrounding environment are expected to be negligible because of the short and intermittent nature of the emission and dust-producing construction phases.

Mitigative Measures

Xcel Energy will employ Best Management Practices ("BMPs") to minimize the amount of fugitive dust created by the construction process. Tracking control at access roads and wetting surfaces are examples of BMPs that will be used to minimize fugitive dust. With the implementation of BMPs, Xcel Energy anticipates minimal impacts to air quality. Therefore, no other mitigative measures are proposed.

6.5.2 Water Quality

Floodplains

The Proposed Route crosses the 100-year floodplains of Chaska Creek and the Minnesota River, and the 500-year floodplain of the Minnesota River in Carver County. The 500-year floodplain information is not available for Scott County. Table 17 summarizes floodplain crossings by Project segment according to FEMA Flood Insurance Rate Maps (FEMA, 1992).

Refer to Appendix B.2: Environmental Features Maps for the location of the floodplain crossings. The floodplain crossings of Chaska Creek and its tributaries (Segments 1 to 3a) occur primarily in agricultural land and correspond to existing roadways. The Minnesota River floodplain crossing occurs primarily in residential areas near downtown Chaska (Segments 4 to 5a), with the remainder of the floodplain crossing (Segment 6) parallel to an existing utility as it extends through the undeveloped portion of the Minnesota River

forested floodplain. Overall, there are a total of 71 acres of 100 year floodplain within the route width and 13 acres of 500-year FEMA floodplain.

TABLE 17
FLOODPLAIN CROSSINGS WITHIN THE ROUTE WIDTH of the PROJECT

Segment ID	500	-yr¹	100)-yr				
Segment 1D	Occurrence	Length (ft)	Occurrence	Length (ft)				
Segment 1	0	0	2	1600				
Segment 2	0	0	1	761				
Segment 3	0	0	1	1102				
Segment 3a	0	0	1	103				
Segment 4	1	2435	1	2391				
Segment 5	2	574	1	3069				
Segment 5a	1	1325	2	760				
Segment 6 Carver	0	0	1	3250				
Segment 6 Scott	NA	NA	1	1051				
Total	4	4,334	11	14,087				
¹500-	¹ 500-year flood plain information is not available for Scott County.							

Wetlands, Waters, and Watercourses

Various large wetland complexes and small isolated wetlands are scattered throughout the Proposed Route. Many of the wetlands are associated with Aue Lake, Chaska Creek, or the Minnesota River. GIS data from the National Wetlands Inventory ("NWI") was reviewed to assess wetlands present within the route width of the Project (i.e., 200' for rebuild segments or 400' for new construction segments. Note that the NWI has not been field verified and sometimes contains inaccuracies; however, NWI is a tool for initial wetland identification and assessment.

In total, 26 separate wetlands consisting of 14 different wetland types were identified within the route width using the NWI data. Of the 14 differing wetland types present, all but two are classified as Palustrine type wetlands (*see* Appendix B.2). The other wetland types within the route width are Lacustrine, which are associated with lakes, and Riverine, which are associated with rivers. Overall, the Proposed Route is approximately 12.75 miles long with a route width that encompasses approximately 334 acres, of which 24.29 acres (7.3%) are

wetlands (see Appendices B.2). Based on average pole structure spacing of 400 feet, it is anticipated that approximately 168 transmission poles will be necessary to complete the proposed construction. Based on this average structure spacing, it is estimated that 12 poles could potentially be placed within wetlands. However, it is anticipated that the number of poles placed in wetlands will be significantly reduced through final Project design efforts focused on avoiding wetland impacts.

The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens (Cowardin et al. 1979). Of those wetlands, the majority contain emergent vegetation with some displaying a mixture of shrubs and herbaceous vegetation. Additionally, three of the Palustrine wetlands have an open water component and contain unconsolidated bottoms. Lacustrine wetland systems are found in the shallow protected areas of lakes with water depth in the deepest part of the wetland basin greater than 6.6 feet. The areas intersected by the proposed route are at locations with existing infrastructure (roadways) and do not appear to be as deep as 6.6 feet, but they are included as part of the same basin. The Riverine System includes all wetlands and deepwater habitats contained within a channel. The Riverine System is bounded on the landward side by upland, by the channel bank (including natural and man-made levees), or by wetland dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. In braided streams, the system is bounded by the banks forming the outer limits of the depression within which the braiding occurs.

The wetlands identified in the route width based on NWI mapping are listed in Table 18 and shown in Appendix B.2.

The MnDNR Public Waters Inventory (PWI) identifies Public Wetlands, Waters and Watercourses. The route width of the Project intersects two Public Waters (P), and two Watercourses (Chaska Creek and its tributaries and the Minnesota River and its tributaries (Chaska Creek East)). There are five intersects with unnamed tributaries to Chaska Creek, five intersects of Chaska Creek, two intersects with tributaries to the Minnesota River (also referred to as Chaska Creek East), and one intersect with the Minnesota River. The Public Waters include 10-226P (Fireman's Clayhole) and 10-28P (Aue Lake). Intersects with Public Waters and Watercourses are listed in Table 19 and shown in Appendix B.2).

TABLE 18
WETLANDS IDENTIFIED WITHIN THE ROUTE WIDTH OF THE PROJECT

County	Cowardin Type	Count	Approx. Area (Acres)
Carver	L1UBH	1	2.40
Carver	PEMA	2	4.54
Carver	PEM/SS1C	1	0.84
Carver	PEM/SS1Cd	1	2.97
Carver	PEMC	7	0.89
Carver	PEMCd	4	5.53
Carver	PFO1C	2	4.01
Carver	PSS1C	1	0.11
Carver	PUBG	1	0.14
Carver	PUBGd	1	1.36
Carver	PUBGx	1	0.01
Carver and	R2UBH	1	0.81
Scott			
Scott	PUB/EMF	1	0.19
Scott	PEMC	1	0.49
Total		26	24.29

TABLE 19
NUMBER OF INTERSECTIONS WITH PUBLIC WETLANDS, WATERS, AND WATERCOURSES IDENTIFIED WITHIN THE ROUTE WIDTH OF THE PROJECT

Name	Seg 1	Seg 2	Seg 3	Seg 3a	Seg 4	Seg 5	Seg 5a	Seg 6
Tributary to Chaska Creek	2	1	1	1				
Chaska Creek		1	3		1			
Tributary to Minnesota River (i.e. Chaska Creek East)						2		
Minnesota River								1
Aue Lake-10- 28P	1							
Firemans's Clayhole-1-226P					1			

Mitigative Measures

Xcel Energy will minimize impacts to public waters and wetlands to the greatest extent possible. Xcel Energy will apply erosion control measures identified in the MPCA Storm Water Best Management Practices Manual, such as the use of silt fencing, to minimize impacts to adjacent water resources. During construction, Xcel Energy will control operations to minimize and prevent material discharge to surface waters. If materials do enter streams, they will be promptly removed and properly disposed of to the extent feasible.

Disturbed surface soils will be stabilized at the completion of the construction process to minimize the potential for subsequent effects on surface water quality. Permanent impacts to public waters and wetlands will be avoided wherever feasible by maximizing the typical span length over these areas.

The proposed transmission line rebuild and new line construction will have minor, short term effects on surface water resources. Most potential effects on surface waters will be related to reconstruction of the transmission line across wetlands proximal to the existing transmission corridor. The Project may require wetland and water resource approvals from the U.S. Army Corps of Engineers (USACE), MnDNR, and several Local Government Units (LGU's). These agencies administer regulatory programs of the federal Clean Water Act and Rivers and Harbors Act, Minnesota Statute 103G "Waters of the State", and Utility Crossing Licenses, and the Minnesota Wetland Conservation Act (WCA). After coordination and application submission, authorization from the USACE would likely fall under a Letter of Permission (LOP-05-MN) or the utility line discharge provision of a Regional General Permit (RGP-3-MN). The MnDNR Division of Waters requires a Public Waters Work Permit for any alteration of the course, current, or cross-section below the ordinary high water level of a Public Water or Watercourse. No such alterations are anticipated as part of the Project.

Carver County, the City of Chaska, and Jackson Township are the LGU's that administer the WCA along the Proposed Route. It is possible that the Board of Water and Soil Resources (BWSR) representatives for Carver and Scott Counties will coordinate with the LGU'S so that one entity administers the WCA over the entire Project. As a utilities project, it is likely that wetland impact minimization will allow the Project to be eligible for a WCA de minimis or utilities exemption. If that is not the case, WCA permits will be required.

Minnesota Statutes Section 84.415 requires a license from the MnDNR Division of Lands and Minerals for the passage of any utility over, under, or across any state land or public

waters. Therefore, Applicants will either confirm the applicability of existing licenses for these crossings or obtain new utility crossing licenses prior to construction.

The MPCA regulates construction activities that may impact storm water under the Clean Water Act. A National Pollutant Discharge Elimination System ("NPDES") permit is required for owners or operators for any construction activity disturbing: 1) one acre or more of soil; 2) less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre; or 3) less than one acre of soil, but the MPCA determines that the activity poses a risk to water resources. In the event that a NPDES permit and Stormwater Pollution Prevention Plan ("SWPPP") are required for the Project, Applicants will obtain the permit and SWPPP.

6.5.3 Flora

The proposed transmission line rebuild and new line construction are primarily located in rural, agricultural areas with the exception of Project segments located in the City of Chaska, which is developed with urban land uses. Table 20 below summarizes land cover within the route width of the Project (*see* Appendix B.3: Land Use Map.)

TABLE 20
LANDCOVER WITHIN THE ROUTE WIDTH OF THE PROJECT

Cover Type	Area (acres)
Forest/Shrub land	42.12
Grassland	0.95
Developed/High Intensity	9.95
Developed/Low Intensity	55.23
Developed/Medium Intensity	20.49
Developed/Open Space	41.10
Herbaceous & Woody Wetlands	8.01
Open Water	4.31
Pasture/Hay/Cropland	152.02

Areas of wetland, grassland and forest are interspersed along the extent of route width with concentrations of forested areas at the east end associated with the Minnesota River. Reed canary grass, cattail, cottonwood, sandbar willow, and sedges are the primary species in wetlands. Common species in forested areas include sugar maple, red maple, basswood,

American elm, box elder, green ash, bur, red, and white oak, and eastern cottonwood. Native grassland is relatively scarce within the Proposed Route.

The Minnesota County Biological Survey ("MCBS") indicates two areas of significant biological diversity associated with the Minnesota River that lie within the route width. However, both sites are below the MCBS minimum biodiversity significance threshold.

Transmission line construction impacts to trees and woodlands will be minimized because the transmission line rebuild will follow existing rights-of-way and new construction will occur along existing roadways. Areas where new transmission line construction is planned are primarily agricultural and will require minimal tree removal (*see* Appendices B.1). For a discussion on impacts to agriculture, see Section 6.3.1.

Mitigative Measures

To minimize impacts to trees and flora along the Proposed Route, Applicants will limit tree clearing and vegetation removal to the transmission line right-of-way, areas necessary for construction access, and areas that impact the safe operation of the facilities. See Section 5.1.4 for a detailed discussion on typical vegetation management and as shown on the schematic included in Appendix H.

6.5.4 Fauna

There are no Wildlife Management Areas ("WMAs"), Waterfowl Production Areas or Game Refuges within one mile of the Proposed Route. The Chaska unit of the Minnesota Valley National Wildlife Refuge is located approximately 0.5 miles south of the Project along the west bank of the Minnesota River.

The croplands, grasslands, wetlands, and woodlands within the Proposed Route provide habitat for a variety of wildlife. Wildlife and other organisms that inhabit the Proposed Route include: small mammals such as mice, voles, and ground squirrels; large mammals such as white-tailed deer; waterfowl and other water birds like pelicans and egrets, songbirds, raptors, upland gamebirds; and reptiles/amphibians such as frogs, salamanders, snakes, and turtles. Lists of mammals, birds, amphibians, and reptiles that are representative of the habitats of the Proposed Route are included in Appendix C. These lists were compiled from previously published inventories of the area, (Hazard, 1982, Janssen, 1987, and LeClere, 2008).

Wildlife that resides within the Proposed Route may be temporarily displaced to adjacent habitats during the construction process. It is anticipated that fish and mollusks that inhabit the local watercourses will not be affected by transmission line rebuild or new line construction because no work will occur within habitat areas that support these species.

The rebuilt and newly constructed transmission lines may affect raptors, waterfowl and other bird species. Birds have the potential to collide with all elevated structures, including power lines. Avian collisions with transmission lines can occur in proximity to agricultural fields that serve as feeding areas, wetlands and water features, and along riparian corridors that may be used during migration.

The electrocution of large birds, such as raptors, is more commonly associated with small distribution lines than large transmission lines. Electrocution occurs when birds with large wingspans come in contact with two conductors or a conductor and a grounding device. Company design standards for transmission and distribution lines provide adequate spacing to minimize the risk of raptor electrocution.

Mitigative Measures

Avian Species

Xcel Energy has been working with various state and federal agencies for over 20 years to address avian issues. In 2002, Xcel Energy Operating Companies, including Xcel Energy, entered into a voluntary Memorandum of Understanding ("MOU") with the U.S. Fish and Wildlife Service ("USFWS") to work together to address avian issues throughout its service territories. The MOU sets forth standard reporting methods and the development of Avian Protection Plans ("APP") for each state that Xcel Energy serves. APPs include designs and other measures aimed at preventing avian electrocutions as described in guidance provided by the Avian Power Line Interaction Committee ("APLIC" 2006) and the guidelines for developing APPs (APLIC and USFWS, 2005). The APP for the Minnesota Territory is complete and retrofit actions for areas with potential avian impacts are underway across the territory. Xcel Energy also addresses avian issues related to transmission projects by:

- Working with resource agencies such as the MnDNR and the USFWS to identify areas that may be appropriate for marking transmission line shield wires with bird diverters; and
- Attempting to avoid areas known as primary migration corridors or migratory resting areas.

In most cases, the shield wire of an overhead transmission line is the most difficult part of the structure for birds to see. Xcel Energy has successfully reduced collisions on certain transmission lines by marking the shield wires with Swan Flight Diverters ("SFDs"), which are pre-formed spiral shaped devices made of polyvinyl chloride that are wrapped around the shield wire. The Proposed Route has been assessed for areas with potential avian issues and areas where SFDs might be warranted have been identified. These areas include the portion of the transmission line rebuild that crosses over the Minnesota River and Aue Lake. Locations where SFDs will be installed are shown in Appendix B.2.

In an email dated April 25, 2011 from Andrew Horton, USFWS Fish and Wildlife Biologist, Mr. Horton stated that according to USFWS records, there are no federally listed or proposed species and/or designated or proposed critical habitat within the action area (i.e., Proposed Route). The USFWS did recommend that bird flight diverters be installed on the shield wire of the transmission line crossing the Minnesota River to minimize avian strikes. As discussed above, the Applicants will install SFDs in this area as recommended by the USFWS and the Minnesota DNR. Xcel Energy will work closely with the MnDNR and USFWS regarding the location of bird flight diverters once the line design is complete.

Other Wildlife Species

With regard to other wildlife species, it is anticipated that any habitat displacement resulting from the proposed Project will be temporary. Therefore, no wildlife mitigation measures are proposed.

6.5.5 Invasive Species Management

Xcel Energy recognizes the need to construct the Project in a manner that minimizes the potential introduction, establishment, or spread of both terrestrial and aquatic invasive species and noxious weeds. The movement of construction equipment to, from, and between various project work sites has the potential to introduce and/or spread invasive species. Such species include reed canary grass, common buckthorn, purple loosestrife, and leafy spurge.

Invasive aquatic species, such as Eurasian water-milfoil, flowering rush and zebra mussels, are not expected to be a significant issue. Xcel Energy anticipates a construction schedule for the Project such that any stringing of conductors over potentially infested waters will occur during winter months over the ice. No boats, barges or other equipment that could spread aquatic invasive species will be used in the construction process.

Mitigative Measures

To minimize the potential for the introduction or spread of invasive species, Xcel Energy proposes to follow a basic set of best management practices during Project construction, including the following:

- All disturbed areas will be re-vegetated using weed-free, state seed mixes compiled by the Minnesota Board of Water and Soil Resources. Native plant species will be used wherever possible to re-vegetate disturbed areas. Weed-free straw or hay will be used for mulching and erosion control;
- Herbicidal and/or manual vegetation removal may be implemented where necessary
 to minimize the spread of invasive species where such removal is consistent with
 specific easement conditions and/or landowner restrictions;
- Prior to arriving at and leaving from construction sites, all construction vehicles and equipment will be cleaned and inspected to remove dirt, mud, plants, and debris from vehicles and equipment to prevent the introduction and spread of invasive species; and
- An Environmental Compliance Monitor will be present on-site periodically to ensure construction crews adhere to proper vehicle and equipment cleaning practices and other construction best management practices.

Additionally, after the detailed design for the rebuild and new construction segments of the Project has been completed, Xcel Energy will coordinate with MnDNR to determine if invasive species mitigation efforts are required and to develop an invasive species management plan as necessary. Prior to commencement of construction activities on state lands or public waters and wetlands, Xcel Energy will consult with MnDNR to determine the presence and extent of invasive species at the construction location and will work with MnDNR to develop site-specific methods to avoid introducing or spreading invasive species during construction.

6.6 RARE AND UNIQUE NATURAL RESOURCES

A request for a Natural Heritage Database Search and comments regarding rare species and natural communities for the Proposed Route was submitted to the MnDNR on March 14, 2011. The results of the MnDNR Natural Heritage Database Search are included in Appendix D.4. The following assessment is based on MnDNR response, a review of the Natural Heritage Database licensed to Westwood Professional Services, and other state and

federal rare species and natural community information. In an email dated January 27, 2012, the MnDNR confirmed there were no new records within the Proposed Route and that the letter dated May 4, 2011 is still valid.

The letter from the MnDNR dated May 4, 2011 indicated rare features have been documented within one mile of the Proposed Route. Of particular note was that the Project crosses a Central Region Regionally Significant Ecological Area (RSEA) with an Outstanding ranking. The DNR Central Region (in partnership with the Metropolitan Council for the 7-county metro area) identified ecologically significant areas by conducting a landscape-scale assessment to inform regional scale land use decisions. The Project is within the RSEA where it crosses the Minnesota River.

According to results of the MnDNR Natural Heritage Database Search, there are thirty-two (32) known occurrences of rare species and sensitive natural communities within 1.5 miles of the Proposed Route as indicated in Table 21 below. These occurrences include three (3) vertebrate species, thirteen (13) invertebrate species, six (6) native plant communities of undetermined class, one (1) Northern Poor Fen Class, two (2) vascular plant species, and one (1) bat colony. Eleven (11) of the thirty-two records are located within 0.5 miles of the Proposed Route and include: Rock Pocketbook (2 records), Yellow Sandshell, Shovelnose Sturgeon (2 records), Wartyback, Mucket, Sessile-flowered Cress, one poor fen, and two native plant communities of an undetermined class. One native plant community consists of Oak Forest (Big Woods) Mesic Subtype and is located approximately 0.25 miles southwest of the west end of the Project. The other is a Red-White Oak (Sugar Maple) Forest Type and is located approximately 0.50 miles west of Segment 2.

TABLE 21
RARE SPECIES AND SENSITIVE NATURAL COMMUNITIES WITHIN 1.5 MILES
OF THE PROPOSED ROUTE

Common Name	Scientific Name	Туре	MN Status ¹	Federal Status	Last Obs.	Proximity (Miles)
Bald Eagle	Haliaeetus leucocephalus	Vertebrate Animal	SC		2007	1.0-1.5
Paddlefish	Polyodon spathula	Vertebrate Animal	THR		12/04/2001	0.5-1.0
Shovelnose Sturgeon	Scaphirhynchus platorynchus	Vertebrate Animal	NON		08/26/1982	1.0-1.5
Shovelnose Sturgeon	Scaphirhynchus platorynchus	Vertebrate Animal	NON		06/05/1987	0.0-0.5

Common Name	Scientific Name	Туре	MN Status ¹	Federal Status	Last Obs.	Proximity (Miles)
Shovelnose Sturgeon	Scaphirhynchus platorynchus	Vertebrate Animal	NON		9/30/1999	0.0-0.5
Shovelnose Sturgeon	Scaphirhynchus platorynchus	Vertebrate Animal	NON		08/19/1982	1.0-1.5
Shovelnose Sturgeon	Scaphirhynchus platorynchus	Vertebrate Animal	NON		08/14/1998	1.0-1.5
Bat Concentration	Bat Colony	Animal Assemblage			06/08/2000	0.5-1.00
Pistolgrip	Tritogonia verrucosa	Invertebrate Animal	THR		08/17/1989	1.0-1.5
Rock Pocketbook	Arcidens confragosus	Invertebrate Animal	END		Pre-1989	0.0-0.5
Rock Pocketbook	Arcidens confragosus	Invertebrate Animal	END		Pre-1989	0.0-0.5
Round Pigtoe	Pleurobema coccineum	Invertebrate Animal	THR		08/16/1989	1.0-1.5
Wartyback	Quadrula nodulata	Invertebrate Animal	END		09/20/2000	0.0-0.5
Yellow Sandshell	Lampsilis teres	Invertebrate Animal	END		10/09/1989	0.0-0.5
Black Sandshell	Ligumia recta	Invertebrate Animal	SC		08/17/1989	1.0-1.5
Ebonyshell	Fusconaia ebena	Invertebrate Animal	END		08/17/1989	1.0-1.5
Elktoe	Alasmidonta marginata	Invertebrate Animal	THR		08/16/1989	1.0-1.5
Fluted-shell	Lasmigona costata	Invertebrate Animal	SC		08/17/1989	1.0-1.5
Hickorynut	Obovaria olivaria	Invertebrate Animal	SC		08/16/1989	1.0-1.5
Higgins Eye	Lampsilis higginsi	Invertebrate Animal	END	LE	PRE-1989	1.0-1.5
Monkeyface	Quadrula metanevra	Invertebrate Animal	THR		08/17/1989	1.0-1.5
Mucket	Actinonaias Iigamentina	Invertebrate Animal	THR		08/17/1989	0.0-0.5
Mucket	Actinonaias Iigamentina	Invertebrate Animal	THR		08/17/1989	1.0-1.5
American Ginseng	Panax quinquefolius	Vascular Plant	SC		06/06/1995	1.0-1.5
Sessile-flowered Cress	Rorippa sessiliflora	Vascular Plant	SC		07/1891	0.0-0.5

Common Name	Scientific Name	Туре	MN Status ¹	Federal Status	Last Obs.	Proximity (Miles)
Native Plant Community, Undet. Class	Not Applicable	Community			06/06/1995	0.5-1.0
Native Plant Community, Undet. Class	Not Applicable	Community			9/14/1995	0.0-0.5
Native Plant Community, Undet. Class	Not Applicable	Community			06/06/1995	1.0-1.5
Native Plant Community, Undet. Class	Not Applicable	Community			06/06/1995	0.0-0.5
Native Plant Community, Undet. Class	Not Applicable	Community			06/06/1995	0.5-1.0
Native Plant Community, Undet.	Not Applicable	Community			06/06/1995	1.0-1.5
Northern Poor Fen	Northern Poor Fen Class	Community			07/08/1998	0.0-0.5

SC = State-listed Special Concern; END = Endangered; THR= Threatened (Minnesota DNR 2007)

Mitigative Measures

The Project and construction process will be designed to avoid encroachment and effects on rare species and unique natural resources to the extent practicable. If rare species or unique natural resources will be affected, Applicants will coordinate with the MnDNR and consider modifying either the construction footprint or the construction practices to minimize impacts.

7.0 AGENCY INVOLVEMENT, PUBLIC PARTICIPATION AND REQUIRED PERMITS AND APPROVALS

7.1 AGENCY CONTACTS

Xcel Energy sent letters to various regulatory and governmental authorities to request review of the Project for applicable comments and concerns. See Appendix D.1. Xcel Energy also sent letters to local governmental units ("LGUs") within the general vicinity of the Project giving LGUs notice of the Project, requesting comments, and allowing LGUs the opportunity to request a meeting to discuss the Project. See Appendix D.2.

7.1.1 United States Fish and Wildlife Service ("USFWS")

Xcel Energy sent a letter to the USFWS on March 14, 2011, requesting a review of the Proposed Route for federally listed threatened and endangered species. In an email dated April 25, 2011 from Andrew Horton, USFWS Fish and Wildlife Biologist, Mr. Horton stated that according to USFWS records, there are no federally listed or proposed species and/or designated or proposed critical habitat within the action area (i.e., Proposed Route) (Appendix D.3). The USFWS did recommend that bird flight diverters be installed on the shield wire of the transmission line crossing the Minnesota River to minimize avian strikes. The Applicants will install bird flight diverters as recommended by the USFWS.

7.1.2 Minnesota Department of Natural Resources ("MnDNR")

Xcel Energy sent letters to the MnDNR Natural Heritage and Nongame Research Program on March 14, 2011, requesting a review of the Proposed Route for state threatened and endangered species and rare natural features. In the MnDNR's response dated May 4, 2011, the MnDNR indicated the proposed Project is unlikely to affect any known occurrences of rare species. The MnDNR did note that the Project crosses a Central Region Regionally Significant Ecological Area (RSEA) with an Outstanding ranking. The DNR Central Region (in partnership with the Metropolitan Council for the 7-county metro area) identified ecologically significant areas by conducting a landscape-scale assessment to inform regional scale land use decisions. The Project is within the RSEA when it crosses the Minnesota River. See Appendix D.4 for the comments from the MnDNR.

7.1.3 Minnesota State Historic Preservation Office ("SHPO")

In a letter dated June 11, 2012, the Minnesota SHPO recommended that an archaeological survey be completed pursuant to the requirements of the Secretary of the Interior's Standards for Identification and Evaluation, and that an evaluation of National Register eligibility for

any properties that are identified be performed. SHPO's comments further state that if the Proposed Route can be documented as previously disturbed or previously surveyed, the need for a new survey will be re-evaluated. (See Appendix D.5). The Applicants will continue to coordinate with SHPO regarding cultural resources within the Proposed Route.

7.1.4 Army Corps of Engineers ("USACE")

Xcel Energy sent a letter to the Corps of Engineers ("USACE") dated March 24, 2011, requesting comments on the proposed Project. In a letter dated April 26, 2011, USACE provided a letter related to the proposed Project (See Appendix D.6). Tamara Cameron, Regulatory Branch Chief of the St. Paul District of the USACE, did not provide specific comments on the Project, but did outline several issues to consider regarding the need for USACE permits for impacts to navigable waters of the United States, dredge or fill of navigable waters, and compliance with NEPA. Ms. Cameron indicated that the segment of the proposed Project that crosses the Minnesota River, a navigable water of the United States, would require a USACE permit under Section 10. Applicants will work with the USACE to obtain a Section 10 permit as well as any other necessary permits for impacts within USACE jurisdiction.

7.1.5 Carver and Scott Counties, Townships and Cities

On March 24, 2011 Xcel Energy sent letters to representatives of Carver and Scott counties, the townships of Dahlgren and Laketown, and the cities of Carver Chanhassen, Chaska, and Shakopee requesting comments on the proposed Project. Xcel Energy met with representatives from Carver and Scott counties to introduce the Project. The county staffs were generally in favor of the need for the Project, requested to be updated on further Project developments and informed of any scope changes. Xcel Energy will continue working with local governments on the Project.

In a letter dated April 19, 2011, the City of Chaska discussed several points with respect to the Project and City of Chaska municipal planning (See Appendix D.7). The primary points were the proposed alignment and its effect on future development of affected parcels, and the proposed methods for retiring transmission lines.

7.2 IDENTIFICATION OF LANDOWNERS

A list of the landowners within and adjacent to the proposed rebuild and new line route is included in Appendix E.1. Addresses have been redacted from the open house landowner sign-in list and comment forms due to privacy concerns.

7.3 Public Participation

Xcel Energy held a public informational meeting at the Chaska City Hall in Chaska, Minnesota on May 4, 2011, prior to developing this Application. This meeting was held to inform landowners and public officials of the proposed Project and solicit input to be used in route selection. A notice for the public informational meeting was published in the Shakopee Valley News on April 27, 2011 and in the Chaska Herald on April 28, 2011. A copy of the newspaper notice is included in Appendix E.2.

Approximately 24 people attended the informational meeting. A copy of the attendance form is included in Appendix E.3.

Generally, public interest focused primarily on the location of the new segment of transmission line within the City of Chaska and the structure design details of the transmission line upgrade segments. A single written comment form was submitted following the May 4, 2011 public meeting. Mr. David Lynch of Cologne requested that he be informed regarding the type of pole structure that will be used for the Project in general and for his property specifically. A copy of Mr. Lynch's submitted comment form is included in Appendix E.3.

Additionally, Xcel Energy received a comment from Mr. David Pokorney representing Community Asset Development Group. Mr. Pokorney's comments pertain to the property located at the southwest corner of the Engler / Highway 212 interchange. Mr. Pokorney's comments set forth potential route alternatives through this area relative to potential future development near the interchange. A copy of Mr. Pokorney's comment letter is included in Appendix E.3.

Xcel Energy has acknowledged these public comments and will follow-up with specific structure design and route information as it becomes available. The Applicants will continue to work with the public throughout the Project permitting process.

7.4 Required Permits and Approvals

Federal, state, and local permits that could potentially be required for the Project are identified below in Table 22 and discussed below.

TABLE 22 POTENTIAL REQUIRED PERMITS

Federal Permits	Jurisdiction
Clean Waters Act Section 404 Permit	USACE
Section 10	USACE
State Permits	Jurisdiction
Certificate of Need (Required)	MPUC
Route Permit (Required)	MPUC
License to Cross Public Waters	MnDNR Divison of Land and
Electise to Cross rubile waters	Minerals
Utility Crossing Permit	MnDOT
Construction Stormwater Permit	MPCA
Minnesota Wetland Conservation Act	Carver County, City of Chaska, and Jackson Township in Scott
Certification	County
Local Permits	Jurisdiction
County Road Permit	Carver and Scott Counties

7.4.1 Federal Permits

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers ("USACE") administers the regulatory programs of the federal Clean Water Act and the Rivers and Harbors Act. The USACE may require authorization of the Project under the utility line discharge provision of a Regional General Permit (RGP-3-MN).

7.4.2 State of Minnesota Permits

Minnesota Public Utilities Commission

Minnesota Statutes Section 216E.03, subd. 2. provides that no person may construct a high-voltage transmission line without a Route Permit from the Commission.

Minnesota Statutes Section 216B.243, subd. 2 states that no large energy facility shall be sited or constructed in Minnesota without the issuance of a Certificate of Need by the Commission. The 115 kV transmission line proposed for the Project is a "large energy facility" because it has a capacity in excess of 100 kV and is more than 10 miles long. Xcel Energy submitted a CON with the Commission on May 15, 2012.

Minnesota Department of Natural Resources

The MnDNR Division of Lands and Minerals regulates utility crossings on, over or under any state land or public water identified on the Public Waters and Wetlands Maps. A license to cross Public Waters is required under Minnesota Statutes Section 84.415 and Minnesota Rules Chapter 6135. The MnDNR Division of Waters requires a Public Waters Work Permit for any alteration of the course, current, or cross-section below the ordinary high water level of a Public Water or Watercourse. The Applicants will work closely with the MnDNR and will obtain these permits as necessary once the line design is complete.

Minnesota Department of Transportation

MnDOT requires the Application for Utility Permit on County Highways Right-of-Way form for the vast majority of utility placements and relocations. Utility owners use this form to request permission to place, construct, and reconstruct utilities within trunk highway right-of-way, whether longitudinal, oblique, or perpendicular to the centerline of the highway. The Applicants will work with MnDOT to determine whether such permit is required and, if so, will obtain the necessary permit from MnDOT.

Minnesota Pollution Control Agency

MPCA requires an NPDES construction storm water permit and Stormwater Pollution Prevention Plan ("SWPPP") for owners or operators of any construction activity disturbing: 1) one acre or more of soil; 2) less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre; or 3) less than one acre of soil, but the MPCA determines that the activity poses a risk to water resources. Most construction activities are covered by the general NPDES storm water permit for construction activity, but some construction sites need individual permit coverage. The Applicants will work with the MPCA to determine if such a permit is required and, if so, will obtain the necessary permit from the MPCA.

7.4.3 Local Permits

Once the MPUC issues a route permit, all zoning, building and land use rules, regulations, and ordinances promulgated by regional, county, local governments are preempted under Minnesota Statutes Section 216E.10, subd. 1.

Carver and Scott Counties

Carver County, the City of Chaska, and Jackson Township (Scott County) locally administer the Minnesota Wetland Conservation Act ("WCA") for the areas along the Proposed Route. It is likely that wetland impact minimization will allow the Project to be eligible for a WCA de

minimis or utilities exemption. If that is not the case, WCA certification of wetland replacement could be required. Carver and Scott counties may also require a county road access permit.

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8.0 REFERENCES

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9.0 DEFINITIONS

Alignment A potential centerline within a route, but not necessarily the physical

center of a route, along which transmission structures could be

located.

Anticipated Applicant's expected location of the transmission line based on initial

Alignment project analysis.

Avian Of or relating to birds.

Breaker Device for opening a circuit.

Bus An electrical conductor that serves as a common connection for two

or more electrical circuits; may be in the form of rigid bars or

stranded conductors or cables.

Centerline The location of the transmission line as measured from the center of

the supporting transmission structures.

Conductor A material or object that permits an electric current to flow easily.

Corona The breakdown or ionization of air in a few centimeters or less

immediately surrounding conductors.

Disconnects A power switch that can be shut off and then locked in the "off"

position.

Easement A permanent right authorizing a person or party to use the land or

property of another for a particular purpose. In the case of this Project, this means acquiring certain rights to build and maintain a transmission line. Landowners are paid a fair price for the easement and can continue to use the land for most purposes, although some

restrictions are included in the agreement.

Electric (E) Field The field of force that is produced as a result of a voltage charge on a

conductor or antenna.

Electromagnetic The term describing the relationship between electricity and

magnetism; a quality that combines both magnetic and electric

properties.

Electromagnetic

Field

The combination of an electric (E) field and a magnetic (H) field.

Electromotive The force (voltage) that produces an electric current in a circuit.

Force ("EMF")

Excavation A cavity formed by cutting, digging, or scooping.

Fauna The collective animals of any place or time that live in mutual

association.

Flora The collective plants of any place or time that live in mutual

association.

Grading To level off to a smooth horizontal or sloping surface.

Grounding To connect electrically with a ground; to connect some point of an

electrical circuit or some item of electrical equipment to earth or to

the conducting medium used in lieu thereof.

Habitat The place or environment where a plant or animal naturally or

normally lives and grows.

High Voltage Transmission

Lines ("HVTL")

Overhead and underground conducting lines of either copper or aluminum used to transmit electric power over relatively long distances, usually from a central generating station to main substations. They are also used for electric power transmission from

one central station to another for load sharing. High voltage

transmission lines typically have a voltage of 115 kV or more.

Hydrocarbons Compounds that contain carbon and hydrogen, found in fossil fuels.

Ionization Removal of an electron from an atom or molecule. The process of

producing ions. The electrically charged particles produced by highenergy radiation, such as light or ultraviolet rays, or by the collision of

particles during thermal agitation.

Magnetic (H)

Field

The region in which the magnetic forces created by a permanent magnet or by a current-carrying conductor or coil can be detected.

The field that is produced when current flows through a conductor or

antenna.

Mitigate To lessen the severity of or alleviate the effects of.

Oxide A compound of oxygen with one other more positive element or

radical.

Ozone A very reactive form of oxygen that combines readily with other

elements and compounds in the atmosphere.

Proposed Route

A transmission line route proposed by the Applicants that encompasses an area between 200 feet and 400 feet in width (i.e., Route Width) along the length between the Project's geographic endpoints. These endpoints include: structure #142 (located west of Aue Lake) and the Scott County Substation; the Victoria Substation to the intersection of County Road 140/Guernsy Avenue; and the West Creek Substation to the intersection of County Road 140/Highway 212. (See Figure 1 in Section 1.1.)

Raptor

A member of the order Falconiformes, which contains the diurnal birds of prey, such as the hawks, harriers, eagles and falcons.

Right-of-Way

The physical land area within the approved Route Width over which land rights are actually required to safely construct, operate, and maintain a transmission line.

Route Width

The area in which the utility is allowed by the Public Utilities Commission to locate the necessary Right-of-Way and complete final design of the transmission facilities.

Sediment

Material deposited by water, wind, or glaciers.

Span

The distance between two supporting structures.

Stray Voltage

A condition that can occur on the electric service entrances to structures from distribution lines. More precisely, stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings such as barns and milking parlors. Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences. Transmission lines, however, can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line.

Substation

A substation is a high voltage electric system facility. It is used to switch generators, equipment, and circuits or lines in and out of a system. It also is used to change AC voltages from one level to another. Some substations are small with little more than a transformer and associated switches. Others are very large with several transformers and dozens of switches and other equipment.

Voltage A unit of electrical pressure, electric potential or potential difference

expressed in volts. The term used to signify electrical pressure. Voltage is a force that causes current to flow through an electrical conductor. The voltage of a circuit is the greatest effective difference

of potential between any two conductors of the circuit.

Voltage Drop The difference in voltage between two points; it is the result of the

loss of electrical pressure as a current flows through a resistance.

Waterfowl A bird that frequents water; especially a swimming game bird (as a

duck or goose) as distinguished from an upland game bird or

shorebird.

Waterfowl Production Area

("WPA")

Waterfowl Production Areas preserve wetlands and grasslands critical to waterfowl and other wildlife. These public lands, managed by the U.S. Fish and Wildlife Service, were included in the National Wildlife Refuge System in 1966 through the National Wildlife Refuge

Administration Act.

Wetland Wetlands are areas that are periodically or permanently inundated by

surface or ground water and support vegetation adapted for life in saturated soil. Wetlands include swamps, marshes, bogs and similar

areas.

Wildlife

Management Area ("WMA") Wildlife Management Areas are part of Minnesota's outdoor recreation system and are established to protect those lands and waters that have a high potential for wildlife production, public hunting, trapping, fishing, and other compatible recreational uses.